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- BIOGEOGRAPHY: A CREATIONIST PERSPECTIVE
- THE LITTLE ICE AGE--PART III
- COULD MAGNETIC MONOPOLES CAUSE ACCELERATED DECAY?

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Articles

Could Magnetic Monopoles Cause Accelerated Decay? 204
Bruce Oliver, Eugene Chaffin

Biogeography: A Creationist Perspective 212
Bill Johnson

The Little Ice Age in the North Atlantic Region Part III: Iceland 224
Peter Klevberg, Michael J. Oard

Minutes of the 2011 Creation Research Society Board of Directors Meeting 252

Departments

Editorial: Not So Gay 196

Media Reviews 238

Conference Abstracts 245

Letter to the Editor 254
- Bioelectric Fields and Symmetric Variation 254

Notes from the Panorama of Science 255
- We Fix Our Eyes Not on What is Seen but on What Is Unseen: Diatom Nanoarchitecture 255
- Neandertal Genes Revealed In Us 261
- For Now We See Only a Reflection: Notes on the Reflector Layer in *Photinus pyralis* Lantern Tissues 263

Instructions to Authors 267

Membership/Subscription Application and Renewal Form 269

Order Blank for Past Issues 270

Haec Credimus

For in six days the Lord made heaven and earth, the sea, and all that in them is, and rested on the seventh.—Exodus 20:11

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Editorial

Not So Gay

Christians must counteract the accusation of being "homophobic" in a society that is increasingly "Christianophobic."

—Donald Calbreath
Christian Research Journal

Last year the state of New York legalized same-sex marriages. As America's third most populous state, New York represents a major milestone in what may become the eventual, but all-too-inevitable legalization by every state. For some, this is heralded as a great moment for the United States. America is finally beginning to move past long-held prejudices and ignorance. Or, at least, that is what they want everyone to foolishly believe.

This slide toward such depravity (whether in America or other countries) was not sudden, nor was it without numerous warning signs. Despite such contemporary euphemisms as "gay" or "same-sex," homosexuality dates to the earliest periods of human history. It is not the "new, hip thing," it is not a special type of love, it is not a sign of social progress, and it certainly does not make anyone more "gay" (in the literal meaning of the word). It is simply the same decadent behavior humans have engaged in for thousands of years, never without consequence and never without social destruction.

I am reminded of the late psychiatrist, Dr. Karl Menninger's question, *Whatever Became of Sin?* (Menniger, 1973). The power of Menninger's question resonates even more today. In fact, we could ask the next question, Whatever became of shame? In addition, Daniel Moynihan (former New York Senator) wrote that the normalizing of deviancy decays the fabric of a healthy society (Moynihan, 1993). Menninger and Moynihan both recognized that sin has not actually disappeared. We have just renamed it. Sin becomes a disease, which then becomes a disorder, which then becomes merely a behavioral problem (or no problem at all).

Once relegated to this "softer" nomenclature, these behaviors are now considered a result of the lack of nutrition, money, education, parental love, or medical attention. As a society, we have removed culpability for our own actions. In so doing, we are making all manner of behavior more "normal" and more acceptable and have invited these into our society.

In "dumbing down" deviancy, homosexuality is simply renamed as an "alternative lifestyle." As an alternative, it is no longer identified as bad, unhealthy, or even deviant. It is simply different. This is one reason proponents of homosexual behavior have so diligently (and, regrettably, successfully) worked for inclusion into "mainstream" social norms and family structures. By using labels, such as "homophobic" or "intolerant," proponents have attempted to castigate those who oppose homosexual behavior.

We love and accept all people, they would argue. Those who oppose us do so because they are judgmental, prejudiced, and hateful. In fact, if you do oppose homosexual behavior, do not be surprised if you are subjected to very hateful and prejudicial behavior by pro-homosexual groups. After all, it is not hypocritical on their part. It is not a double standard. Rather, your opposition to homosexuality is clear evidence of your hate. So you deserve to be treated accordingly. What could be a better "litmus test" for hatred? Thus, your intolerance will no longer be tolerated.

Just three decades ago the featuring of "gay couples" or even a homosexual character in television programs or movies was infrequent. Today we see shows not only featuring but also promoting homosexual relationships. In fact, such characters and subject content in a television program or movie is almost offered as a sign of being enlightened and educated. Only the ignorant and uneducated would be offended. This is clearly an example of what Moynihan alluded to: the social acceptance of deviancy.

Once sin is accepted as normal or commonplace, we seem to lose the ability to distinguish right and wrong (Prov. 17:15; Isa. 5:20; Rom. 1:28; Eph. 4:18–19). In fact, once sin is accepted, it becomes common for people to begin to love sin and hate what is good (Prov. 17:15; Rom. 1:29–32). The darkness of sin hates being exposed by the goodness of God (John 3:18–20). Therefore, in a rush to justify homosexual behavior, biblical teachings are ignored and often ridiculed.

Some challenge that Moynihan's arguments are misleading. Many behaviors once considered deviant are really not bad behaviors after all. Instead, their acceptance actually represents a growth of society and human understanding. Hence, what is or is not deviant is merely a cultural perception and will change as societies grow and mature.

Of course, this proves even more our profound need for guidance from our Creator. Only He knows what is and is not good behavior (for both individuals and a healthy society). He alone is able to set the true standard. All other standards are subject to human opinion, which is notoriously varied, changing, and inconsistent (i.e., limited by our own sinful nature).

Biblical Admonitions

The "church" has been strongly affected by this steady erosion of social standards. We are not unlike Lot, who had become so accustomed to an environment of sin and decadency that he offered his daughters to the men of Sodom as a "lesser evil" (Gen. 19:1–8). In denomination after denomination and church group after church group, we see a progressive acceptance of homosexual pastors, homosexual couples, and homosexual behavior. It hardly seems coincidental that these very same churches struggle with issues of biblical authority in other matters too, such as sanctification through Christ, inerrancy of Scripture, and biblical creation.

Biblical admonishments against homosexuality are plentiful in both Old and New Testament writings (e.g., Lev. 18:22; 20:13; Rom. 1:26–27; 1 Cor. 6:9–10). To counter this, homosexual advocates make various suspect justifications that these passages really do not condemn homosexuality. Such passages are just being misunderstood by those "Bible-thumping" literalists as they make their ignorant noises. Advocates occasionally even argue that phrases such as "Jonathan loved [David]" (1 Sam 18:1) suggest David and Jonathan were engaged in a sexual relationship. Some have even suggested the Bible promotes same-sex relationships (e.g., Harwood, 2002).

In fact, to defend their erroneous claims, some homosexual proponents have even argued that Jesus and His disciples engaged in homosexual activity (Johns, 2003). So extreme has the thinking become that one activist argues that "since there is no proof of the heterosexuality of Jesus, the theological basis of Church homophobia is all the more shaky and indefensible" (Peter Tatchell, as quoted by Sears and Osten, 2003, p. 135). The irrationality of such reasoning hardly warrants a response. We can only guess at what Mr. Tatchell would consider "proof."

Besides being extremely poor hermeneutics, such offerings are really nothing more than an attempt to justify their own sin (Isa. 3:9). It is an attempt to sear their consciences (1 Tim. 4:2; Titus 1:15), pretending the Bible does not condemn homosexuality, pretending that it is normal and acceptable within Christian teachings. Sadly, some Christians (so-called) have foolishly listened also.

Despite such ridiculous assertions, there is one concept that is very clear. Biblical marriage is strictly between a man and a woman. There are *no exceptions* in either biblical example or instruction. God-ordained same-sex marriage simple does not exist in the Bible. Yet, all sex outside of marriage is also strongly condemned (Matt. 15:19; Rom. 1:29; 1 Cor. 7:2; Jude 7). Hence, all other claims notwithstanding, any and all acts of homosexuality stand outside of acceptable biblical practice, because they are outside the bounds of biblical marriage. End of argument. No exceptions. No equivocations. No foolishness on the part of some biblically illiterate (or indifferent) pastor or bishop.

The Search for the Gay Gene

Advocates of homosexuality have argued that some people are naturally homosexual, just as others are naturally heterosexual. As people are born with brown hair or blue eyes, so homosexuals are born with a genetic disposition toward homosexual behavior. Thus, they are genetically programmed to be homosexual, just as others are genetically programmed to be heterosexual.

This so-called "gay gene" gives advocates another means of justifying their sin. They cannot help it. They were born that way. If anything, it is God's fault for making them that way. The former Christian singer, Ray Boltz, suggests that his homosexual nature is simply how God made him (DiGuglielmo, 2008). (He now sings songs about how Jesus accepts his homosexuality.)

These arguments suggest a deterministic-type genetic link to homosexual desire, much as hair or eye color has a genetic link. If people are homosexuals because their genetic programming makes them that way, then it is not a choice, a deviancy, or even a sin. It is their natural, God-ordained nature.

> Little wonder societies that readily embrace evolution soon embrace a non-biblical view of marriage as well.

Social scientists have repeatedly attempted to draw genetic causes to various behaviors. At best, they have only been able to determine that certain genetic profiles provide a tendency toward specific behavior (such as alcoholism). Such a tendency hardly compels anyone to engage in the behavior. More often, however, it is difficult to even demonstrate any direct connections between genetics and behavior. Many studies have initially declared such a connection and "were announced with great fanfare [and] greeted unskeptically in the popular press" but "are now in disrepute" (Mann, 1994, p. 1687).

In an early attempt to detect a "gay gene," a research group lead by Dean Hamer suggested a tendency of homosexuals to have a unique DNA site on their X chromosome (Hamer et al., 1993; Hu et al., 1995). However, this site, designated Xq28, probably consists of 100 genes, with no indication which (if any) might be a "gay gene" or what the function of any genes in this region serve. In response, Fausto-Sterling et al. (1993) claimed that Hamer's work lacked adequate controls and failed to present sufficient analysis to justify any claimed homosexual link with the Xq28 chromosome site. They further concluded that even if there were a correlation between the presence of the Xq28 site and homosexuality, "correlation does not necessarily indicate causation" (Fausto-Sterling et al., 1993, p. 1257). In addition, subsequent attempts to verify the results of Hamer's studies have not been successful (Rice et al., 1999; Wickelgren, 1999).

More recently, Hamer's group was unable to find a link between male sexual orientation and differences in pre-natal brain exposure of estrogen (DuPree et al., 2004). His group also attempted to more precisely identify a "gay" gene or genes. However, even with much greater detail of the human genome than was available in the 1990s, they were unable to obtain any conclusive results (Mustanski et al., 2005).

Studying twins has also been pursued as an indirect means of detecting a "gay gene." Since identical twins share identical genomes, there should be a higher correlation of homosexuality between identical twins than found between non-twin siblings (i.e., both twins should either be homosexual because they possess the "gay gene," or heterosexual because they do not have the gene). Following this line of reasoning, various studies have attempted to detect such a correlation. Bailey et al. (2000, p. 534) studied a large number of twins and concluded if any homosexual gene existed, it was in the study group at a "low penetration or low frequency." In a later study, Långström et al. (2010, p. 75) also analyzed a large number of twins and found a low-level of genetic correlation with homosexual twins but were obligated to note that the data had a very high variance, which "suggest cautious interpretation."

In a different line of study, LeVay (1991) used autopsied brain tissue to detect differences between homosexual and heterosexual males. Of all the brain regions he studied, the only tissue differences he reported were found in INAH-3 tissue. However, most of the brain tissue from the homosexual subjects was from individuals who had died of AIDS. LeVay did not appear to have made any effort to determine if tissue differences could have resulted from the AIDS disease instead (for example, did brain differences result because of AIDS effect on testosterone levels). Also, any difference between homosexual and heterosexual men was minor and difficult to clearly interpret.

Later studies have failed to replicate LeVay's results. For example, Savic and Lindström (2008) also performed tissue examination. They monitored blood flow to detect any brain function differences between heterosexual and homosexual males. While they reported finding a modest difference, their results could not distinguish between "cause and effect." Was the difference a cause of or an effect of homosexuality? Are males homosexual because they have a different brain function than heterosexual males, or is a brain function difference (if any) the result of actively engaging in homosexual behavior (and the emotional and physiological effects that may incur)?

It is not insignificant that both LeVay and Hamer are openly homosexual. Hamer has not published any more efforts to find a "gay gene" and appears to have changed his research focus. An Internet search reveals that LeVay is far more active in promoting homosexual social and political agendas than in pursuing any additional research studies.

Of related interest is the potential ability of homosexuals to "stop" being homosexual. If any genetic predisposition were significant, such reverse behavior would not be very plausible and certainly not very frequent. Masters and Johnson (1979) stated that "reparative therapy" was often effective for individuals who wanted to change. I personally remember the sharp criticism they received for making such a claim. This idea was repugnant to gay activists since it suggested their behavior may simply be a choice, and it suggested that their behavior could even be regarded as needing to be changed. They felt that Masters and Johnson—hardly friends of any anti-homosexual thinking—had betrayed them.

Additional studies have continued to suggest possible "transformation" of homosexuals (e.g., Nicolosi et al., 2000; Throckmorton, 2002). Spitzer (2003) studied 200 individuals and reported that "reparative therapy" could be successful. Not surprisingly, his report precipitated a series of critical letters, including concern that a journal would even publish such a report. The journal's editor acknowledged the emotional tension surrounding the topic was so "contaminated by rhetorical fervor" that it will cloud any type of conclusions (Zucker, 2003, p. 400).

What is more, even if there were a strong genetic or brain chemistry link to homosexuality, does that necessary remove the distinction between desire and behavior? I think we would all recognize that we have many desires we realize we should not or cannot act upon. This is our sinful nature. Thus, not all desires do, or should, develop into a behavioral action. Having the desire does not negate the ability to choose to act upon it. Otherwise, we would have to alter our view of many deviant behaviors as well as our entire concept of criminal law.

In our fallen world, many people apparently have pedophilic urges (Green, 2002). In fact, Seto (2012) argues that pedophilia is another form of sexual orientation. Does this mean it is acceptable to act upon pedophilia desires? What about desires of bestiality? Can excessive amounts of testosterone now be a justification for violence, sexual assault, and even murder? Could murderers or rapists argue that the desire was too great and they simply had no choice?

How is the line drawn between which desires can be acted upon and which cannot? Here again, humans find themselves on shifting sands, where each individual's answer will likely be based upon their own sociopolitical agenda. Nevertheless, if "gay gene" advocates are to be consistent with their own arguments, then it becomes difficult for them to answer "no" to these questions.

Homosexuality Healthy?

An oft overlooked but significant aspect of the homosexual lifestyle is the medical dangers it presents. Homosexual behavior and practices by males make them very vulnerable to a wide array of diseases and medical conditions. The homosexual male has "an increased risk of contracting sexually transmitted diseases (STDs) and HIV" (Eriksson and Berglund, 2007, p. 207). In fact, homosexual males are the reservoir (i.e., the continual source) of virtually all STDs. Most "gay" males have had at least one infection of an STD (Handsfield, 1981) and will likely have more in their lifetime.

A Center for Disease Control (CDC, Atlanta, GA) report states that the majority of HIV infections in America are found in homosexual men, even though they comprise only 2% of the population (CDC, 2010). A survey of articles in the *International Journal of STD & AIDS* documents the higher prevalence of HIV, STDS, and other health problems in the homosexual male (e.g., Grierson et al., 2005; Marcus et al., 2004; Mayans and Escribá, 2003; McAllister et al., 2008; Scoular et al., 2008). It is well realized among the medical profession (though not always publicly) that homosexual males generally need their own specialized physicians who are knowledgeable about their numerous health problems. Even homosexual females have a high incidence of many common STDs (Edwards and Thin, 1990; Hughes and Evans, 2003; Marrazzo, et al., 1998; Skinner, et. al., 1996).

Mental health issues are also closely associated with homosexual behavior. Several studies have found a higher suicide rate among homosexuals (Eskin et al., 2005; Fergusson et al., 1999; de Graaf et al., 2006; Herrell et al., 1999). This is often blamed upon deep feelings of guilt resulting from strong negative social attitudes that have been directed at them. However, these higher suicide rates were found even within the tolerant and promiscuous society of The Netherlands (de Graaf et al., 2006). In addition, homosexuals (and bisexuals) have greater incidence of mental disorders (Fergusson et al., 1999; Sandfort et al., 2001), exhibitionist and voyeuristic behavior (Langström and Seto, 2006), and sexual promiscuity (Eisenberg, 2001).

The simple question to ask would be: If homosexuality was created by God or was even simply "natural," why would it involve such physical and mental health problems?

The Evolution of Homosexuality

Contemporary homosexuality draws deeply upon evolutionary teaching and a philosophy of naturalism. At its very root are ideas drawn from a form of natural physical law, not so much Plato's ideas of natural law. Rather, that human behavior is rooted in biological factors of genetics, social environment, and chemical predestination. Whether this law gives humans full freedom of thought and action or makes our actions more constrained within a natural determinism is still debated by proponents of naturalism (Cashmore, 2010).

Whether as a choice or not, naturalism provides a popular justification for homosexuality because homoerotic behavior is widespread in the animal world (Bailey and Zuk, 2009). Natural law tells us that all of biology can serve as a guide to understand what is normal for humans, i.e., what is natural. Thus, if a variety of animals (from snails to snakes) have homoerotic tendencies, then it would only be natural that humans have these tendencies also.

As with other behavioral traits, animals again become a model system for understanding human sexual behavior. After all, we are merely a higher evolved order of animal. So, it takes very little "leap" of reasoning for evolutionists to conclude that homosexuality is natural. Through the filter of naturalism, evolution provides a very comfortable social structure for the "normalcy" of homosexuality. In fact, within this construct, heterosexuality cannot be viewed as more socially beneficial than homosexuality, and societies have no basis for excluding same-sex marriage.

However, conveniently overlooked in these arguments is that actual same-sex copulation between animals is rare.

While various animals may display forms of homoerotic behavior (at least as defined by the human researcher), the human version of homosexual intercourse is far from widespread in the animal world. What is more, various forms of rape, pedophilia, incest, theft, and murder occur in the animal world. Does that give us a justification for the normalcy of these behaviors as well?

Evolution also has difficulty accounting for the origin of human homosexuality. What evolutionary benefit does homosexuality provide? It would provide little reproductive advantage (at least as defined by Darwinism). Why would the behavior even evolve initially? By Darwinian criteria, only those behaviors and adaptations that increase survivability would be favorably selected.

Numerous studies have found a significant connection between childhood abuse and the subsequent development of homosexual behavior.

A variety of speculations have been offered for the evolution of homosexuality. These include enhanced survival of isolated males, balanced polymorphism, and sexual antagonism (Ciani, et al., 2008; Kirkpatrick, 2000; Muscarella, 2000). Each of these scenarios has serious weaknesses (e.g., see discussions in Ciani at al., 2008, and in Schwartz et al., 2010), and few address the evolution of the homosexual female. In fact, some of these scenarios are just as effective for explaining the extinction of the female homosexual as they are for explaining the origin of the male homosexual. This is not exactly what homosexual advocates are seeking.

Thus, according to contemporary thinking, homosexuality evolved because of a combination of social, genetic, and environmental factors. In other words, they really have no idea, but since homosexuality exists it must have served (and still serve?) some evolutionary purpose. Of course, the evolution myth also struggles to explain the institution of marriage—often relegating it to a social construct that a female found was necessary to enhance her and her children's survival. As technology reduces the female's dependency on male protection and food gathering, marriage becomes less evolutionarily necessary. Little wonder societies that readily embrace evolution soon embrace a nonbiblical view of marriage as well.

What is typically downplayed in understanding the origin and persistency of homosexual behavior is its link with abuse. Numerous studies have found a significant connection between childhood abuse (physical, emotional, and sexual) and the subsequent development of homosexual behavior (e.g., see review of these studies in Wilson and Widom, 2010). The connection may be even more prevalent if it is sexual abuse of boys by another male (Eskin et al., 2005). Lack of a supporting father may also be a contributing factor (Eskin et al., 2005).

Rather than some elaborate evolutionary selection process or the action of some complicated genetic switch, homosexuality appears to have its origin in perversion. Should we be surprised? We abuse our children (those who depend upon us for love, comfort, and protection), and the effect can be devastating and lifelong. The "sins of our fathers" can directly and tragically impact several generations afterwards (Exod. 34:6–7; Deut. 5:9). Homosexuality becomes one of the many possible consequences of the child's emotional scars.

Homosexual advocates may not like this conclusion. They certainly do not want to hear that the behavior is just another consequence of a fallen creation, just another sordid tale of human travesty. But the evidence is clear enough that it keeps appearing in study after study—attempts to "spin" it otherwise notwithstanding.

When All is Said and Done

Regardless of the weakness of the evidence for a genetic basis for homosexuality, all too often the contemporary mind-set will still assume some type of genetic/physiological cause. The comments of one Internet writer exemplify this mind-set.

> Even though scientists have yet to identify the "gay gene," the vast consensus in the scientific community is that homosexuality has a strong genetic basis, based on multiple studies that point to heritability of [homoerotic identity and behavior]. Many scientists believe that there is not just one gay gene, but in fact a multitude of genetic markers that are either switched on or off by a complex dance of epigenetic and environmental factors. Either way, it cannot be denied that being gay is rooted in one's biology" (Maria, 2011. Brackets added).

So there we have it. Despite inadequate evidence for a genetic or physiological cause of homosexuality, we know such a cause exists. It is just too complicated to understand at the moment. It simply will take time to finally determine the biological connections. In the meantime, we can just throw around some vague generalities, appeal to the complexity of biology, and feel confident that we just "know." In fact, I fear it is likely that this arrogant confidence will steadily influence future research, perhaps even interfering with the publication of non-favorable results.

Over the years I have increasingly observed how little importance actual evidence is to most people. Modernistic man merely gives lip service to evidence. He pretends to carefully evaluate the facts and use them to make a logical decision. In reality, people's decisions are often based upon their limited perception of reality, which is heavily shaped by their emotional state of mind (and simple wishful thinking). In our sinful world, truth has little meaning. Ignorance, not truth, guides people's thinking (Rom. 1:21; Eph. 4:18). Sadly, this applies even to many who identify themselves as Christian.

People naively view homosexuality as just another sexual behavior, no better or worse than any other. Those who are critical of homoerotic behavior and same-sex marriage are viewed as just ignorant Bible-thumpers. However, the consequence of social acceptance of homosexuality is far more destructive than they possibly imagine. What is more, a society that no longer regards homosexuality as deviant inevitably accepts other destructive behaviors also: sexual promiscuity, spiritualism, abortion, and the list goes on and on. While some may eventually decry the social destruction occurring all around them, few will recognize it is the consequence of defying God's laws (Isa. 3:9).

Same-sex marriage is neither God ordained nor socially healthy. As such, same-sex marriage does not expand the role of marriage or give it greater social power. It actually diminishes marriage and replaces it with a flimsy institution based mostly upon convenience rather than commitment. A society that broadens God's boundaries of marriage inevitably has no boundaries. Such a society will decay at its very core.

Now, having said all this, I also want to strongly state that we are called upon to show love (1 Cor. 16:13–14; Gal. 5:14; Eph. 4:14–15; Phil. 1:9–10). Angry threats and hate mail sent to Ray Boltz was neither Christlike nor useful. While God clearly condemns homosexuality (Rom. 1:26–27), He also clearly condemns envy, deceit, gossip, arrogance, and slander (Rom. 1:29–30), behaviors that all of us are guilty of at one time or another. We can stand strong in our criticism of sin without engaging in hateful and angry tirades.

I have several friends who are ex-addicts of gambling, alcohol, pornography, etc. Their stories reveal that the lure of the addiction is so powerful that they will always be addicted. They join the ranks of an almost countless number of people who deal with a variety of emotional and physical cravings. It is a daily struggle for them to control the obsession and remain free from their addiction's bondage. Some succeed. Some do not. And, of course, some never are willing to admit they even have an addiction, often to their own destruction. Ray Boltz's struggle with his homoerotic desires seems strikingly similar.

Our weak bodies and sometimes even weaker spirits constantly agonize with the temptations and desires that the fallen creation immerses us in so deeply. Only Christ, as our Savior, has the power to help raise us above our weaknesses. Only Christ, as our Creator, has the power to pull us through our addictions. We all need to support each other through God's love and patient guidance.

Kevin Anderson, Ph.D.
Editor
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Could Magnetic Monopoles Cause Accelerated Decay?

Bruce Oliver, Eugene Chaffin*

Abstract

We study the effect of superheavy magnetic monopoles on nuclei such as Aluminum-26 and Potassium-40, to see if the rate of beta decay is enhanced by the nearby passage of a magnetic monopole. Following an idea of Carrigan (1980a, 1980b), we consider the possibility that monopoles are trapped in the earth's interior by a balance between gravitational and magnetic forces from the earth's fields. Magnetic reversals such as those considered by Humphreys sent the monopoles to the surface during the Genesis Flood, causing nuclear decay rates to seem to accelerate. We use theory developed by Lipkin in the 1980s to treat the theory of perturbation of the decay rates by the monopoles. We show that the monopole velocities attained during a field reversal are sufficient for them to escape during the Flood, but not large enough to produce tracks in rocks and minerals similar to fission tracks.

Introduction

Any amateur scientist who has studied magnets has noticed that a bar magnet has two opposite poles that cannot be separated. In particle physics, theory says that particles made of a single north pole or a single south pole may exist in isolation (Figure 1), and these hypothetical particles are called *magnetic monopoles*, or *monopoles* for short.

Magnetic monopoles are associated with magnetic field lines. A magnetic monopole is either a south or a north pole. The field lines of these monopoles are affected by the magnetic charge that a north or south monopole may have. A south magnetic monopole has an isolated negative magnetic charge, which causes the magnetic field lines to converge toward the

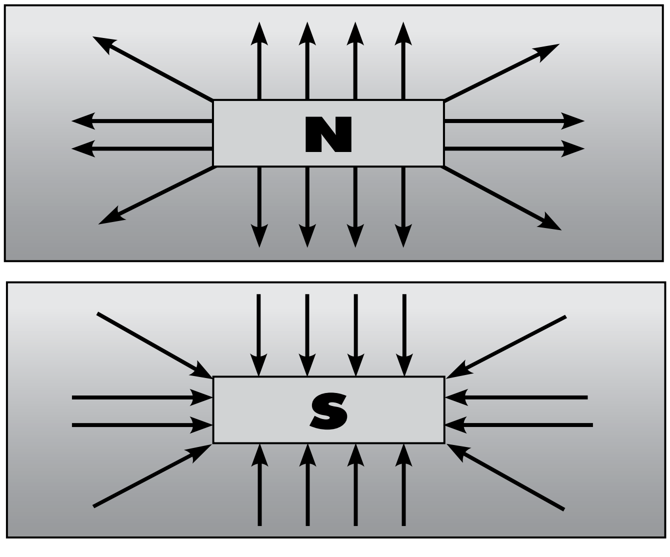

Figure 1. (a) North magnetic monopole containing a positive magnetic charge causes magnetic field lines to radiate away from the pole.

(b) South magnetic monopole containing a negative magnetic charge causes magnetic field lines to radiate toward the pole.

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pole. A north magnetic monopole has an isolated positive charge, which causes the magnetic field lines to radiate away from the pole. Since magnetic monopoles have a strong charge, they will cause ionization of surrounding atoms. The strong magnetic charges that these monopoles carry may also instigate a huge disturbance to the nuclei of atoms as the monopoles pass nearby and affect nuclear decay. The magnetic field lines of monopoles may cause the nucleus to be excited to higher energy levels, may trigger the angular momentum of the nucleus to change, and may generate a faster nuclear decay process.

In modern physics, the concept of a magnetic monopole was considered by Dirac (1931), who concluded that the magnetic charge had to be quantized in order to be consistent with quantum theory. There have been numerous experimental attempts to detect magnetic monopoles coming from space or to detect the tracks they may have left in rocks (Alvarez, 1975; Cabrera, 1982; Fleischer et al., 1969; Fleischer, Price, and Woods, 1969; Fleischer and Walker, 1975; Kolm et al., 1971; Malkus, 1951; Price et al., 1975; Price and Salamon, 1986; Ross, 1976; Ullman, 1981). Kolm et al. (1971) showed an emulsion track 1875 microns long with suspicious characteristics. The maximum length of fission tracks, tracks produced by the fission fragments coming from fission of uranium, is about 16 microns in the minerals, such as mica and obsidian (Fleischer et al., 1969). Price et al. (1975) reported monopole detection in a balloon-borne detector, but the claim was later withdrawn. Cabrera (1982) reported the detection of a single monopole in a superconducting loop detector, but this failed to be confirmed by other experiments.

In the 1970s, the prospects for magnetic-monopole hunters suddenly improved. Theoretical treatments appeared, giving monopole solutions without the singularities in Dirac's mathematical treatment. Working independently, Gerard 't Hooft of the University of Utrecht in the Netherlands and Alexander M. Polyakov of the Landau Institute for Theoretical Physics near Moscow found certain theories that not only allow magnetic monopoles but also demand them.

Further work by other particle theorists led to so-called grand unified theories combining electromagnetic, weak, and strong nuclear forces. These theories predict the existence of magnetic monopoles, although their mass-energy is of the order of 10^{11} GeV (Rubakov, 1981a, 1981b; Preskill, 1979, 1984; Carrigan and Trower, 1982). This is a large value, beyond the capabilities of present-day accelerators.

Experiments at Fermilab (Abbott et al., 1998) have ruled out monopoles with mass-energies less than 600 GeV. The Large Hadron Collider (LHC) is now operational, but the mass of the monopoles predicted by the grand unified theories is so large that there is not much hope that a monopole will be detected. Interestingly, the interaction of a magnetic monopole with a magnetic field is much more robust than the interaction of an electric charge with an electric field. In the early 1980s, Carrigan and Trower (1982) were able to write: "A magnetic monopole traversing a superconducting coil one meter long would gain more energy than a proton acquires in the largest particle accelerator ever built." The largest accelerator of 1982 was the FermiLab accelerator before its upgrade to the present 1 TeV capability. The beam energy then was about 200 GeV. Superconducting magnets made with current technology can produce magnetic fields with a strength in the tens of Teslas range (1 Tesla = 10^4 gauss). The LHC particle accelerator employs niobium-titanium (Nb-Ti) magnets operating at 1.9 K, which allows them to run safely at 8.3 Teslas. Calculation shows that a 10 Tesla (100,000 gauss) superconducting magnet would accelerate a monopole to a kinetic energy of 200 GeV.

If the superheavy monopoles predicted by theory exist, where would they be found? Parker (1970) noted that if free monopoles exist in space, they would be accelerated to very high energies by the magnetic fields. He established what is now known as the *Parker bound* on the abundance of free monopoles in space. Too many monopoles would absorb too much energy from the interstellar and intergalactic magnetic fields, causing these magnetic fields to disappear. If the galactic magnetic field is not dissipated or distorted, then the monopoles cannot be present at a density of more than one per 10^{21} cm^3. Thus, the Parker bound placed severe limits on the flux of magnetic monopoles that would be able to impinge upon the earth.

Carrigan (1980a, 1980b) proposed that gravity can become an important consideration in the fate of monopoles and that monopoles could be trapped inside the earth's core. Energetic monopoles would slow down by causing ionization trails as they pass through the earth and would concentrate at a radius inside the earth's core, where magnetic forces on the monopoles would be cancelled by the gravitational attraction. In section 2, we will present our calculations of the radius inside the earth at which this would occur.

Lipkin (1983, 1984) examined whether monopoles passing near to a nucleus could induce a beta decay to occur. Ordinary beta decays are thought to be spontaneous, but in the high magnetic field produced by the monopole, the decay rate is accelerated. Lipkin (1949) and Merzbacher (1951) showed that high-energy photons could not accelerate decays to any appreciable extent. However, the theory allows monopoles to succeed where other candidate particles do not.

Quantum theory gives certain selection rules, the rules for changes in spin and parity that must be obeyed if a transition between two energy levels is to have a large probability. However, these selection rules are generally not obeyed in the decays employed in radioisotope dating techniques. For such techniques, nuclei with a large half-life are needed; hence the so-called forbidden transitions are normally of importance in such cases. When a monopole approaches a nucleus, it can lead to a way to bypass the normal routes for the transitions involved. The monopole induces the nucleus to transition to an excited state with a different spin and parity than the ground state, which then has a larger probability of beta decay. Lipkin presented calculations for the deuteron and for the Al-26 nucleus. If the monopole passed within a few femtometers (1 femtometer = 1 fermi $=10^{-15}$ meters), the decay was accelerated. We have applied Lipkin's method for the decay of K-40, the nucleus used in potassium-argon dating. We discuss these calculations in section 3.

The Interaction of Monopoles with the Earth's Magnetic Field

Carrigan (1980a, 1980b) proposed that the monopoles could be trapped inside the earth's core at a radius of $R = 0.18R_E$, where R_E is the radius of the earth (Figure 2). At this radius, the inward gravitational force on a superheavy monopole of mass 0.06 micrograms (corresponding to a mass-energy of 10^{16} GeV) would equal the outward magnetic force. Carrigan did not give the model he assumed for the magnetic field inside the earth. We have repeated the calculation using the magnetic field equation in the model of Barnes (1973), yielding $R = 0.02R_E$. Energetic monopoles would slow down by causing ionization trails as they pass through the earth and become thermalized. By "thermalized," we mean that they have the same average kinetic energy as the atoms of the surroundings. Once thermalized they would drift slowly toward this point where the gravitational force would cancel the magnetic force (Carrigan, 1980a).

By solving Maxwell's equations for a model in which the earth has a conducting, spherical core, and matching the interior solutions to the exterior solutions at the boundary between core and mantle, Barnes (1973) obtained the following equation for the radial equation for the magnetic field inside the core:

$$B_r = \frac{\pi^2\left(\frac{R_E}{R_C}\right)^3 B_0}{\left(\frac{\pi r}{R_C}\right)^2}\left(\frac{\sin\left(\frac{\pi r}{R_C}\right)}{\frac{\pi r}{R_C}} - \cos\left(\frac{\pi r}{R_C}\right)\right)\cos(\theta) \tag{1}$$

Here B_0 is the earth's magnetic field at the pole and the equation is valid only inside the core. The angle θ is the spherical coordinate angle between the z-axis and the line to the field point. Outside the core, one has:

$$B_r = \frac{B_0 R_E^3 \cos(\theta)}{r^3} \tag{2}$$

Using Carrigan's value for the mass of the monopoles, we find that the gravitational force balances the magnetic force at a radius $r = 0.02\ R_E$, which is inside the earth's inner core.

In the Humphreys (1987, 1988) scenario for magnetic field reversals, rapid field reversals take place during the Genesis Flood. During such field reversals, the predominate component of the earth's magnetic field is no longer the dipole component (Humphreys, 2002), and the chaotic behavior of the field lines during reversals has been established by the computer simulations of Glatzmaier (Ladbury, 1996; Olson et al., 1999; Glatzmaier and Roberts, 1995a, 1995b). Thus, during the rapid field reversals, the monopoles would no longer be confined inside the core, and could be expected to escape to larger radii and to impinge upon radioactive nuclei contained in surface rocks.

In the Glatzmaier simulations, the magnetic field inside the earth's core can be as large as 560 gauss (Glatzmaier and Roberts, 1995b). This would move the point where the magnetic monopoles concentrate from the $0.02R_E$ radius outward to a point closer to Carrigan's $0.18R_E$ value. During a reversal, the monopoles could be launched outward by the chaotic behavior of the magnetic field lines, causing the monopoles to interact with nuclei inside the crustal rocks. In the next section we will examine the effect that the monopoles would have on some radioisotopes, and hence on radioisotope dating.

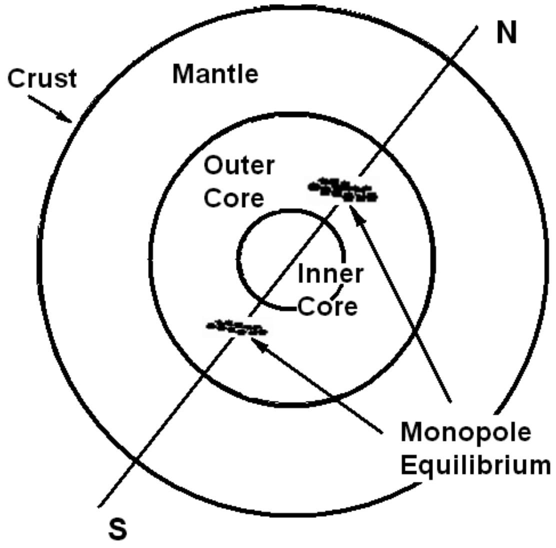

Figure 2. The earth's interior showing the inner and outer cores, and the mantle, with the equilibrium point for the magnetic monopoles.

Calculation of the Effect of a Monopole on Beta-Decay

The dating of radioisotopes relies heavily on beta decay and/ or alpha decay. Beta-minus decay is a process whereby a neutron turns into a proton and emits an electron and an antineutrino (Figure 3). The process whereby a nucleus undergoes beta decay has to do with the quarks that make up a proton and a neutron. Modern studies show beta decay occurs when a quark changes flavor from down to up. The W^- particle is the particle that decays into an electron and an antineutrino. Allowed and forbidden decay are involved in radioisotope dating (Chaffin, 2005). An allowed decay is one in which the parity change is zero and the spherical symmetry is conserved. Forbidden decay occurs when isotopes violate several factors, such as change in parity and spherical symmetry, or the angular momentum changes by more than one quantum number. Nuclear beta decay transitions of isotopes proceed at rates that depend on the squares of quantities known as *matrix elements*. These *matrix elements* are usually derived from perturbation theory, which is used to find solutions to complicated quantum systems. Perturbation theory is very useful for comparing or mixing different types of systems. Lipkin used perturbation theory for explaining the mixing of nuclear wave functions by a superheavy monopole with a strong magnetic field as it approaches the nucleus of an atom (Lipkin, 1983, 1984). He predicted that the closer a monopole approaches the nucleus, the faster the nucleus would decay. He first explained his theoretical approach by using the parameters and properties of a deuteron, which is a simple nucleus containing a proton and a neutron. The proton and neutron that make up the nuclei of a deuteron were involved in solving the electric and magnetic matrix elements for the transitions. Lipkin also considered the effect of a magnetic monopole passing near an Aluminum-26 nucleus. Aluminum-26 is of interest in studies of the solar system, where evidence of extinct radioactivity due to the Al-26 exists (Lee et al., 1976). The estimates of beta-decay matrix elements needed for Lipkin's calculation were obtained with nuclear wave functions by a method known as the "shell model method," along with experimental data of the values of magnetic moments. These experimental values were taken from ^{25}Al and ^{25}Mg, thus providing input data to give accurate calculations within Lipkin's theoretical treatment. The experimental values included the magnetic moments, which Lipkin used as follows:

^{25}Mg = -0.9 and ^{25}Al = 3.6 nuclear magnetons (Lipkin, 1983).

The shell method usually incorporates shells denoted as: s, p, d, and f (Figure 4), corresponding to different orbital

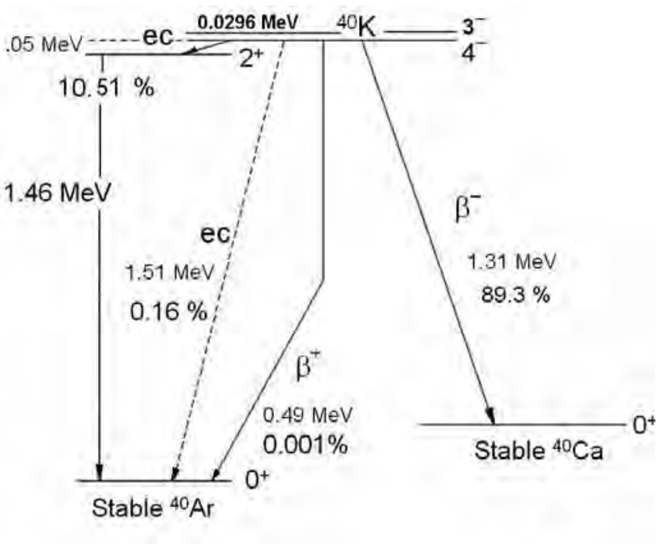

Figure 3. Decay scheme of ^{40}K, showing the electron capture (ec), beta-minus (β^-), and beta-plus (β^+) branches.

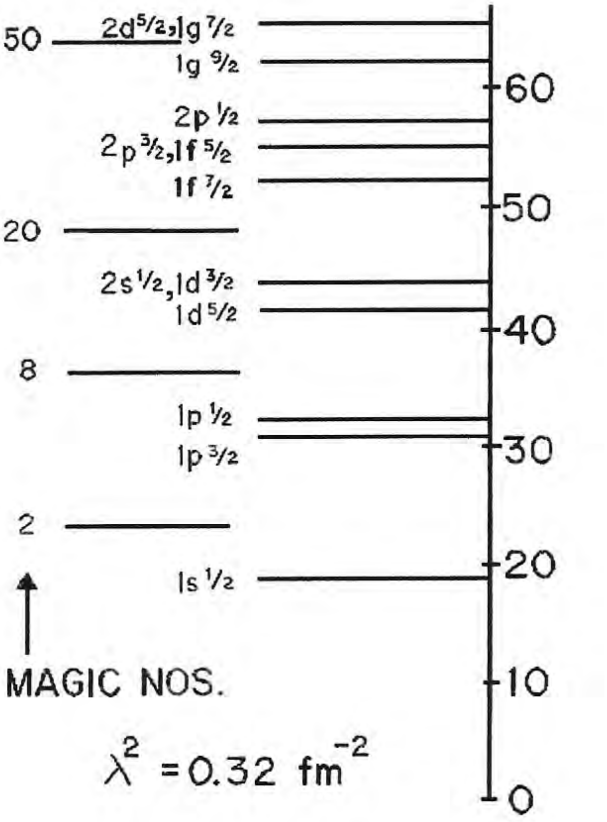

Figure 4. Energy levels according to the nuclear shell model, showing the s, p, d, f orbital angular momentum designations as well as the half-integral total angular momentum of the level. The scale at the right gives the energy in MeV, and the closed shell occupation numbers (magic numbers) are shown at the left.

angular momenta quantum numbers. These shells help to describe the single-particle states a proton or neutron will occupy. Lipkin also focused on using the nuclear properties of ^{26}Al. The spin states of ^{26}Al were predicted from an unpaired or missing neutron and an unpaired or missing proton both in the "d" 5/2 shell, where 5/2 is the spin of the single-particle state of the last particle outside the shell. The beta-plus decay of ^{26}Al to ^{26}Mg involved transitions that could be accelerated by a monopole, if the monopole caused the Al-26 to first transition to excited states. These magnetic effects caused by the monopole thus yield a shorter lifetime for ^{26}Al. Lipkin used "log ft" values to predict how close a monopole would have to be in order to cause this accelerated decay. Lipkin's final results were expressed in terms of the equations:

$$\log ft(5^{+} - 0^{+}) = 7.4 + 16\log r \qquad (3a)$$

$$\log ft({}^{+}5 - 2^{+}) = 6.8 + 8\log r \qquad (3b)$$

where r is the distance of the monopole from the nuclear center in fermis (Lipkin, 1983).

These results were compared with the normal or undisturbed log ft value of 14.2 in order to obtain the amount of acceleration of the decay (Lipkin, 1983). Lipkin's method of explaining how close a monopole must be to a nucleus is the same method we used for determining whether or not our isotope would experience accelerated decay. As Lipkin proposed, we also imagine a fixed distance that a monopole has to be within near the nucleus in order to allow an accelerated decay. Since we are exciting the nucleus with a monopole moving with respect to time, we used time-dependent perturbation theory. Radioisotope dating is one of the main methods used in dating how old certain rocks are. Different isotopes that have significant configurations will yield acceptable dates of rocks. Potassium-40 (^{40}K) is an isotope used commonly in radioisotope dating. We chose to examine Potassium-40 as our isotope for study. This isotope has two main branches of decay. Potassium-40 can undergo beta-minus decay to produce Calcium-40 or ^{40}K can undergo electron capture, which produces Argon-40. Nuclear isotopic stability is related to two factors. When both the atomic mass and the atomic number are even integers, there is more likelihood of stability. When the nuclear spin changes by zero or plus or minus one and the parity does not change, the beta decay is said to be an allowed decay. Since potassium in general has only nineteen protons and twenty-one neutrons, special shell model procedures must be taken into consideration. In the nuclear shell model, the designations s, p, d, f, g, and h represent different shells that the protons and neutrons can go into. Once a shell contains the maximum number of neutrons (or protons), we call the shell a "closed shell." In our case we needed to balance our atomic mass and atomic number in order to get a stable isotope. For the shell model configuration we find that we have one hole in the proton $d_{3/2}$ shell and one neutron into the neutron $f_{7/2}$ shell. These neutron and proton configurations were used to find the lowest and highest spin states that Potassium-40 could attain. The following algebra for our spin states, where J represents spin state, was used to find the lowest and highest spin states: $J = J_1 + J_2 = |3/2 - 7/2|, \ldots\ldots, 3/2 + 7/2 = 2, 3, 4, 5$. These possible spin states are considered in order to calculate the fixed distance that a monopole must be within in order to cause accelerated decay. For low-lying energy levels of K-40, the outer or valence protons and neutrons occupy the $d_{3/2}$ shell and the $f_{7/2}$ shell, respectively. We must add the total wave function of our proton hole and neutron in order to get the total angular momentum that is needed to explain the existing energy levels. The "4" spin state for ^{40}K is the ground state, thus we only needed the angular momenta that could explain the energy levels from the 2^{-} - 3^{-} states. Figure 5 shows the low-lying energy levels of K-40. The coefficients used for adding the total angular momentum for two wave functions were called "Clebsch-Gordon coefficients." These coefficients, often given in tables in reference works for quantum-mechanical calculations, are the numbers needed to combine two wave functions of definite angular momentum to give an overall wave function of a given total angular momentum, J and angular momentum projection M.

To calculate the probability of the monopole causing the nucleus to decay, we use time dependent perturbation theory (see Griffiths, 2005, Chapter 9). The main effort involves finding a so-called "matrix element" of the monopole perturbation operator between two states, the ground state and the intermediate state that the monopole excites the nucleus to before it undergoes beta decay to an energy level of the daughter nucleus

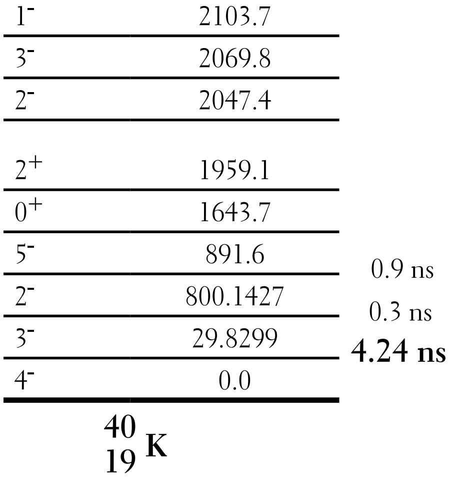

Figure 5. Low-lying levels of K-40, showing spins and parity, energies in keV, and lifetimes in nanoseconds.

Argon-40. We find the largest contribution to the transition probability comes from the 4^- ground state being excited to the low-lying 3^- and 2^- intermediate states.

The Clebsch-Gordon coefficients for combining the proton-hole 3/2 states with the outer neutron's 7/2 states become part of the following expressions for finding the matrix elements for the $<4^- \rightarrow 2^->$ and $<4^- \rightarrow 3^->$ transitions:

$$\sum_{m_1 m_2} C^{3/2\ 7/2\ 2}_{m_1\ m_2\ M}\, C^{3/2\ 7/2\ 4}_{m_1\ m_2\ M'}\, (m_1 - m_2)^2 \tag{4a}$$

$$\sum_{m_1 m_2} C^{3/2\ 7/2\ 3}_{m_1\ m_2\ M}\, C^{3/2\ 7/2\ 4}_{m_1\ m_2\ M'}\, (m_1 - m_2) \tag{4b}$$

For these two quantities, we were able to calculate the values 5.714 and 1.914.

These values were substituted into the standard perturbation theory equations to get the "log ft" value, for an assumed distance of closest approach of the monopole. In order to determine our log ft, we needed the most recent, and the best experimental value of log ft of ^{40}K, which is 11.55. By using this value, we were able to predict whether the $<4^- \rightarrow 2^->$ and $<4^- \rightarrow 3^->$ transitions yielded the most effect on the transition rate. By using the experimental value of the log ft (11.55, see National Nuclear Data Center web site, http://www.nndc.bnl.gov/chart/), we obtained the following distances:

The transition $<4^- \rightarrow 2^->$ gives an appreciably enhanced transition rate when the monopole approaches within r = 0.61 to 1.5 fermis.

The transition $<4^- \rightarrow 3^->$ gives an appreciably enhanced transition rate, but the monopole must approach closer, to within r = 0.1 to 0.6 fermis.

Thus the $<4^- \rightarrow 2^->$ transition had the largest effect, and we may use it to obtain the order of magnitude of the monopole's effect of the K-40 nuclear decay.

Wechsung, Strassheim, and Bass (1971, p. 567) calculated wave functions for the low-lying odd-parity states of K-40, using nuclear shell model techniques involving mixing of different orbital configurations in the single-particle wavefunctions. The ground state of the K-40 nucleus is predominately the $(d_{3/2})^{-1}(f_{7/2})^1$ configuration, that is, one hole in the proton $d_{3/2}$ orbital and one neutron in the $f_{7/2}$ orbital (Gorringe, 2006; Dieperink et al., 1968; Klotz et al., 1972; Southon et al., 1976; Wakatsuki et al., 1970). Wechsung et al., (1971) included shell-model configurations where there was one neutron in the $1f_{7/2}$ orbital and one hole in the proton $1d_{3/2}$ orbital, as well as configurations where the neutron occupied the $2p_{3/2}$ orbital or the proton hole was in the $2s_{1/2}$ orbital. Their Table 5 gave the results of calculations of the coefficients of different configurations contributing to the wavefunctions of the low-lying states of K-40. In order to calculate the effect of the monopole exciting the K-40 nucleus to higher energy levels, we adopted the Wechsung et al (1971) wave functions for the spin and parity 3^- states and also calculated an extra 3^- state beyond the two they gave in their paper. This enabled us to estimate the contribution of these excited states to the transition to states of Ar-40 by beta-plus and electron capture. We find by direct calculations that the excited states of K-40 higher than the ones already included contribute very little to the transition probability, due to the fact that conflicting configurations begin to dominate the wavefunctions as the excitation energy increases.

Discussion

In a FermiLab preprint, Carrigan (1980b) wrote:

> For a monopole in thermal equilibrium with the liquid core at a temperature of 4000°K, the monopole thermal velocity is on the order of 10^{-2} cm/sec. Likewise the average mass drift velocity in the core is on the same order. On the other hand if an axial field of 100 gauss is present the characteristic monopole velocity might be 10^5 cm/sec based on extrapolating the Ahlen energy loss formula to low beta values. With the complex coiled field geometry fully on, monopoles would move to equilibrium positions probably near the surface of the solid core or the inner surface of the mantle in about one year.

We have checked Carrigan's statement using the energy loss formula of Lindhard quoted in Ahlen and Kinoshita (1982), and we also find a velocity of approximately 10^5 cm/s for a monopole in the core, which loses energy by ionization at the same rate at which it gains energy by acceleration in a 100-gauss magnetic field. For this order of magnitude of monopole speed, the monopoles could reach the earth's crust well inside the time frame of a yearlong, worldwide flood. Hence, magnetic reversals during the Flood seem to be capable of causing the monopoles to pass near and thereby to influence crustal rocks in accord with our general scenario.

Are the monopoles energetic enough to produce tracks in rocks and minerals similar to those left by fission fragments? If they are, then our paradigm would be falsified by the fact that such tracks are not found in Earth rocks. However, Price and Salamon (1986, p. 1226), in discussing the stopping power S_n for monopoles by elastic collisions with nuclei and the stopping power S_e for ionization and electronic excitation, wrote:

> At $v < 10^{-2}$ c most of the energy lost by a heavy ion goes into elastic collisions with nuclei, producing displaced atoms directly. This "nuclear" component of energy loss, S_n, has its peak value for ion velocities -10^{-3} c. For a bare monopole, S_n is far too small to form a track[4] and S_e is also too small except at velocities v ~ c.

Since our characteristic velocity of 10^5 centimeters per second is about 10^{-5} times the speed of light, c, these monopoles moving with this speed will not produce permanent tracks in rocks and minerals.

Our calculation discussed earlier indicates that a K-40 nucleus must approach within a radius of 1.5 fermis or 1.5x10^{-15} meters to be induced to transform to Ar-40, giving a cross section of $\pi r^2 = 7.069\text{x}10^{-26}$ cm^2. If 50% of the K-40 atoms are to be passed by a monopole within the one year of the Flood, then this would indicate that the flux would have to be 2.242 x 10^{17} monopoles/(cm^2 s). This is a relatively large flux and indicates that a large number of monopoles would have to have been trapped inside the earth and brought to the surface by the field reversals during the Flood.

Conclusion

In conclusion, our research has not uncovered any reason why magnetic monopoles, released via magnetic field reversals of the earth during the Genesis Flood, could not have caused a significant amount of accelerated decay. Our study shows that magnetic monopoles can attain velocities in the right ranges to be able to escape the earth's interior during magnetic field reversals, but yet slow enough that they do not cause permanent tracks in rocks. They could provide an important mechanism for causing rocks that contain potassium-40 to undergo an accelerated decay. Our cross section and flux values show that numerous amounts of monopoles would have increased the accelerated decay of potassium-40. The small time factor for monopoles to reach the surface shows that they could contribute to accelerated decay during magnetic field reversals and thus during the Genesis Flood.

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Biogeography: A Creationist Perspective

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Abstract

Biogeography, or the distribution of plant and animal life, is an important topic in helping to determine the origin of different life-forms. Creationists and evolutionists have tried to reconcile the geography of life with how they believe history unfolded, the latter far more than the former. While evolutionists argue that biogeography demonstrates their worldview, nothing could be farther from the truth. The evolutionary argument consists of ad hoc rationalizations and ruling out of alternative theories by straw-man argumentation. Furthermore, the creationist view, when presented fairly, provides a much simpler and compelling explanation for the geography of life.

Introduction

Why is it that animals and plants are not equally distributed over the face of the earth? Why are some animals, like giraffes and lions, confined to only one location—Africa, whereas other plants and animals are either ubiquitously or discontinuously distributed? Biogeography, or the geography of life, has been an active field of study for centuries. Early creationists tried to explain these distributions a variety of ways. Universal Flood geologists postulated that all animals dispersed from the Middle East, and early evolutionists attempted to explain these distributions consistent with their understanding of natural history.

From the mid-nineteenth century to the present, evolutionists have dominated the biogeographical debate, and creationists have largely remained silent on the issue. As a result, it is commonly believed that evolution best explains the geography of life. Jerry Coyne, professor of biology at the University of Chicago, claimed, "The biogeographical evidence for evolution is now so powerful that I have never seen a creationist book, article, or lecture that has tried to refute it. Creationists simply pretend that the evidence doesn't exist" (Coyne, 2009, p. 88).

A review of the scientific literature reveals that macroevolutionary biogeography is far from proven. (In this context, *macroevolution* is defined as the large scale biological changes necessary for the common descent of all life.) The geography of life is complex and poses problems for both evolution and creation models. Although biogeography cannot prove either model, one of these two can *best explain* the facts. While evolutionists consider biogeography to be one of the best arguments demonstrating descent with modification, the argument from biogeography consists mostly of ad hoc hypotheses and the ruling out of alternative interpretations by straw-man argumentation. It is an argument largely based on negative evidence.

Land Bridges

Until recently, it was widely accepted that the continents as we know them have always been in their current locations. Belief in the permanence of the continents led many evolutionists to explain distributions by postulating land bridges between the continents. These land bridges crisscrossed every ocean and were thrown up or torn down wherever and whenever their theory required. Up until the second half of the twentieth century, most evolutionists employed

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this line of reasoning. Ernst Haeckel is a case in point.

> Recent history of the earth … has repeatedly been connected with the European continent and been repeatedly separated from it. Nay, even Europe and America have been directly connected. The South Sea at one time formed a large Pacific continent, and the numerous little islands which now lie scattered in it were simply the highest peaks of the mountains covering that continent. The Indian Ocean formed a continent which extended from the Sunda Islands along the southern coast of Asia to the east coast of Africa (Haeckel, 1892, pp. 375–376).

Everywhere there was a disjunct distribution to explain, evolutionists like Haeckel "sharpened their pencils and sketched land bridges between the appropriate continents" (Corliss, 1970, p. 61). Some of the land bridges were small and plausible; others, such as the landmass that stretched across the entire Pacific Ocean to allow bears, raccoons, and other animals to gain access to the American continent, were of continental proportion. After the fauna and flora reached their appointed destination, the evolutionists' "eraser disposed of the bridge when it had outlived its usefulness as evidenced by the divergence of species on the sundered continents" (Corliss, 1970, p. 61).

The problem with continental land bridges and their sudden disappearance after they served their purpose was that in nearly every case there was absolutely no geological evidence for their existence. The only reason for their construction was to explain away the puzzling distributions of life. The use of land bridges is now an embarrassing chapter in the history of biogeography.

> To get around the problems of fossil distributions, they posited ancient "land bridges" wherever they were needed. When an ancient horse named Hipparion was found to have lived in France and Florida at the same time, a land bridge was drawn across the Atlantic. When it was realized that ancient tapirs had existed simultaneously in South America and Southeast Asia a land bridge was drawn there, too. Soon maps of prehistoric seas were almost solid with hypothesized land bridges—from North America to Europe, from Brazil to Africa, from Southeast Asia to Australia, from Australia to Antarctica. These connective tendrils had not only conveniently appeared whenever it was necessary to move a living organism from one landmass to another, but then obligingly vanished without leaving a trace of their former existence. None of this, of course, was supported by so much as a grain of actual evidence—nothing so wrong could be—yet it was geological orthodoxy for the next half century (Bryson, 2003, pp. 175–176).

Ghiselin added:

> Such *ad hoc* hypothesizing was the common practice among biogeographers of the time, with the conspicuous exceptions of Darwin and Wallace. If one allows oneself the luxury of land-bridges as rationalizations—like catastrophes in geology—one can explain anything. There may well have been quite different connections between continents in the past, but their existence must be verified in terms of independent evidence, and not invoked merely to explain away difficulties (Ghiselin, 1969, p. 40).

Even Darwin, who was once an avid land bridge builder, eventually saw just how convenient it was to throw up land bridges to explain distributions. In a letter to J. D. Hooker he noted that some conjure up land bridges "as easily as a cook does pancakes" (Darwin, 1959, p. 432). This ad hoc reasoning evidently convicted most of the scientific establishment, because after the second half of the twentieth century, land bridges were invoked only as a last resort.

Oceanic Dispersal

Another way to explain the puzzling distribution of life is to have animals and plants crossing formidable water gaps by means of rafting, or, in the case of birds, postulating island colonizations achieved by transoceanic flights. Darwin and Alfred Wallace seemed to favor this explanation, and Ernst Mayr used oceanic dispersal to explain how the banded iguana came to reside in the south Pacific.

> The lizard family Iguanidae is confined to the Americas, except for one genus (with two species) found in Fiji and Tonga … Since these are endemic species they could not have been brought there by humans. The only possible explanation is that a long time ago they floated there on logs and flotsam carried by ocean currents (Mayr, 2001, p. 32).

Mayr's explanation seems plausible until one realizes that the Fiji Islands are 5,000 miles away from America. Granting a generous thirty miles of drift per day for this treacherous journey (which required a sail mate of the opposite sex), the iguanas would have arrived in Fiji eight months later! If this sounds incredible, consider the distance involved in bird colonizations. Mayr and Phelps claimed the Hawaiian Islands house many land birds that supposedly migrated there from the American continents. These birds would have had to fly over 2,000 miles without the aid of intervening islands to serve as "stepping-stones" (Mayr and Phelps, 1967). Some of these long-distance colonizations seem miraculous, and even Mayr feels that "the distances involved in some of these colonizations are truly miraculous" (Mayr and Phelps, 1967, p. 299).

The scientific literature is full of examples of long-distance dispersal that could be described only as miraculous, including the dispersal of freshwater fish (i.e., cichlids) found only in Africa and South America. Phillip Darlington, the most prominent biogeographer of the twentieth century, flirted with a south Atlantic land bridge but favored the hypothesis that these fish traveled out of Africa, up through Asia, across the Bering land bridge, down North and Central America, and finally into South America (Darlington, 1957). The most amazing part of this story is the disjunct distribution is also explained by extinction in the intermediate parts of a wide distribution that did not leave a single fossil behind.

Nearly all stories of long-distance dispersal, whether oceanic or otherwise, are ad hoc and often downright miraculous. Dispersalism has been called "a science of the improbable, the rare, the mysterious, and the miraculous" (Nelson, 1978, p. 289). Dispersalist explanations also have been compared to "Kipling's *Just So Stories* … although Kipling's illustrations were better" (Funk, 2004, p. 649). Even ardent defenders of dispersalism have acknowledged that their conclusions are "pseudoscientific" and "nonfalsifiable" (McDowall, 1978, p. 96).

Some evolutionists are impervious to the "improbability" and "untestability" of long-distance over-water dispersal. They claim that we know dispersal over water does occur and, given plenty of time, some dispersals will reach and colonize far distant islands. Coyne for example, wrote,

> Suppose that a given species has only one chance in a million of colonizing an island each year. It's easy to show that after a million years have passed, there is a large probability that the island would have been colonized at least once: 63 percent, to be exact (Coyne, 2009, p. 106).

By simply inflating the available time, evolutionists conclude that anything that *can* happen *will* eventually happen! Or as G. G. Simpson bluntly put it, "Any event that is not absolutely impossible … becomes probable if enough time passes" (Coyne, 2009, p. 106). Like so many times before, when Darwinians encounter a complicated problem they simply appeal to more time as the solution. "Time," wrote evolutionist Alexander Wolsky (1976, p. 95), "is the only *Deus ex machina* which neo-Darwinists invoke when in difficulty."

Continental Drift

The growing frustration with dispersalism and the acceptance of plate tectonics and cladistic taxonomy in the 1960s led many evolutionists to opt for what is called vicariance biogeography, i.e., that most plants and animals were widely distributed on the super continent Pangaea and the discontinuities we observe today are largely due to the breakup of this continent. The cichlids, along with other fish, would not have had to travel tens of thousands of miles from Africa to South America (as Darlington claims); they needed only to disperse a short distance while the continents were still together. With vicariance it appeared that evolutionary biogeography was saved from the embarrassing theories of the past. "The emergence of modern vicariance biogeography and the theory of plate tectonics thus put an end to exaggerated hypotheses of jump dispersal and trans-oceanic land bridges" (Giller et al., 2004, p. 276). Or has it?

While it is claimed that continental drift can explain many discontinuities without resorting to ad hoc reasoning, it appears to have raised more problems than it solved. For example, if the continents were once connected, why are there not more fauna and flora similarities between the southern continents? (This was one reason why many evolutionists rejected land bridges for chance dispersal.)

Another problem with the vicariance theory is that it requires many taxa to have originated preceding the breakup of Pangaea. For example, it is now believed that freshwater cichlids appear in the fossil record only after the fragmentation of Gondwana (i.e., the southern hemisphere). Donn Rosen's response, "Fossils give a minimum rather than maximum age of a taxon" (Rosen, 1985, p. 636), is common and demonstrates that the vicariance biogeographers rely on ad hoc hypotheses just as much as the disperalists. Like Darlington, when the evidence does not fit the theory, the explanation is the extreme imperfection of the geological record.

More recently, evolutionary dating methods have shown that many plants and animals evolved after the continents separated. This would include freshwater fish (i.e., aplocheiloid, cichlid), ratite birds, parrots, frogs, baobab trees, and *anolis* lizards (Briggs, 2003; De Queiroz, 2005). Some have even used the fossil record to show that the entire New Zealand flora is the result of oceanic dispersalism (Pole, 1994). Evolutionists are now forced to acknowledge that long-distance dispersalism must have played an even greater role than many have suspected. In an article titled "Goodbye Gondwana," Matt McGlone (2005, p. 739) wrote:

> While vicariance remains a respectable and likely explanation for many disjunct biotic distributions around the globe, recent developments have undermined the preeminence it has enjoyed since plate tectonics and cladistics elevated it in the 1960s and 1970s. We are now in the middle of a dispersalist counter-revolution … fuelled by an outpouring of molecular phylogenies. To the credit of those who stuck by it, dispersal biogeography continued to advance through the latter half of the last century, despite the jibes that it was mainly a producer of 'just-so-stories' and despite the exhausting and unproductive task of countering the constricted worldview of cladistic biogeography and the alternative

> universe of panbiogeography. The recent flood of evidence supporting transoceanic dispersal … has put it in the driving seat in the South.

Vicariance biogeographers have tried to deal with this contradictory data by questioning the reliability of molecular dating (Sparks and Smith, 2005; Nelson and Ladiges, 2009). They have been unsuccessful in convincing many, and dispersalist scenarios are now being widely published. We are in the midst of another paradigm shift and a return to "a science of the improbable, the rare, the mysterious, and the miraculous" (Nelson, 1978, p. 289).

Immune to Falsification

Evolutionary biogeography has now come full circle. We started with the dispersal stories of Darwin and Wallace and, through many decades and many paradigm shifts, have ended with the same narratives. The "recent flood of evidence" that McGlone and others talk about is not evidence, per se; rather it is lack of evidence for drift. Alan De Queiroz (2005, p. 70) notes, "A main objection to dispersal hypotheses is that they are unfalsifiable and thus unscientific … However, this can be countered by noting that, if plausible vicariance hypotheses are falsified, then dispersal is supported by default."

Not only is evolutionary biogeography based on negative evidence, but the evolutionist also has a smorgasbord of hypotheses to choose from to explain every distribution. Rather than considering the possibility that the theory of evolution is incapable of explaining life's geography, the dissatisfaction of one hypothesis only leads them to another.

The traditional explanation for the distribution of the banded iguana is over-water dispersal, a view that has been defended as recently as three years ago (Keogh et al., 2008). Those who dislike this explanation have argued for the view that iguanas were widely distributed in the southern hemisphere and they walked on dry land from Asia or Australia to Fiji via a Melanesian land bridge (Noonan and Sites, 2010). Another way to move South Pacific plants and animals long distances (though the iguana may be too young for this approach) is to postulate a large former continent in the southwestern Pacific, the remnants of which allowed plants and animals to travel several thousand miles until the fragments became sutured into the North and South American continents (Nur and Ben-Avraham, 1981; Nelson and Platnick, 1980).

The explanations given for the dispersal of freshwater fish are just as eclectic. Evolutionists originally postulated a land bridge between Africa and South America (Eigenmann, 1909). Darlington (1957) followed this idea by moving these fish across almost every continent. Along came vicariance with its explanation of short-distance dispersal before the continents fragmented (Stiassny, 1991; Murphy and Collier, 1997). Now that many freshwater fish are judged as too young to have been moved by drift, the explanation is that they are tolerant of saltwater and made the long journey across the Atlantic Ocean.

> If, as the fossil record seems to indicate, the aplocheiloid fishes are too young to have been carried about on tectonic plates, how did they achieve their circumglobal range? The answer does not appear to be difficult. For many years, these fishes have been allocated to a category called "secondary freshwater fishes" … Some of the species live in brackish water and others can tolerate the higher salinity of seawater (Briggs, 2003, p. 549).

Other explanations of plant and animal dispersal include transportation by floating whale carcasses (Smith et al., 1989); now vanished islands that served as stepping stones for short-distance dispersal, such as the islands between Australia and Tasmania (Nunn, 2009), and Easter Island and South America (Newman and Foster, 1983); and when dispersal by natural causes seems untenable, as in the case of the coconut's sea journey from Southeast Asia to Panama, the explanation is a pre-Columbian trans-Pacific journey by human beings (Ward and Brookfield, 1992).

Although some of these explanations have contributed to understanding the distribution of life, this does not change the fact that biogeography can "explain" every distribution in a multitude of ways, while never making a prediction that could subject the theory to falsification. Even evolutionists have long recognized that it is an explain-all theory.

> The peculiarities of geographical distribution seem very difficult of explanation on any theory. Darwin calls in alternately winds, tides, birds, beasts, all animated nature, as the diffusers of species, and then a good many of the same agencies as impenetrable barriers. There are some impenetrable barriers between the Galapagos Islands, but not between New Zealand and South America. Continents are created to join Australia and the Cape of Good Hope, while a sea as broad as the English Channel is elsewhere a valid line of demarcation. With these facilities of hypotheses there seems to be no particular reason why many theories should not be true. However an animal may have been produced, it must have been produced somewhere, and it must either have spread very widely, or not have spread, and Darwin can give good reason for both results (Fleming Jenkin quoted in Hull, 1973, p. 342).
>
> From a theoretical point of view held by some methodologists and philosophers of science (*e.g.* Popper) that is a poor hypothesis [dispersal of marsupials] because it is not falsifiable by any evidence now in hand or known to be obtainable. However, no hypothesis on this subject

> is absolutely and clearly falsifiable (Simpson, 1978, p. 323).
>
> Before continental drift was discovered the Darwinians explained the distribution of life on earth in terms of dispersal; after the discovery of drift they explained the same distribution without such heavy reliance on dispersal. … One is tempted to ask what observations the Darwinians can't explain. (Leith, 1981, p. 539).

Some evolutionists are convinced that biogeography could contradict contemporary evolutionary teachings. According to Douglas Theobald (2010), "We confidently predict that fossils of recently evolved animals like apes and elephants should never be found on South America, Antarctica, or Australia." Such a discovery, however, would not falsify the theory of evolution. Instead it would lead evolutionists to construct land bridges or argue, as some have, that elephants can swim long distances with their trunks used as snorkels (Brown and Lomolino, 1998; Johnson, 1980). Since a fossil elephant was recently discovered in Java, a swim from lower Indonesia to Australia with possible intervening now submerged islands could likely be postulated.

Straw-man Argumentation

If biogeography is an explain-all theory, incapable of proof or disproof, how can it be regarded as evidence for evolution? And if all animal and plant distributions can be explained by land bridges, continental drift, and over-water dispersal, what prevents the creationist from utilizing the same explanations? It is extremely difficult to make an argument for evolution from traditional biogeography (i.e., without any assumption of evolution).

Evolutionists, however, feel by alleging that creation demands certain patterns of distribution not observed in the biological world, evolution becomes the only theory consistent with the biogeographical data. This is essential to their argument and is the reason why attacks on creation permeate most every defense of this subject.

> He who admits the doctrine of the creation of each separate species, will have to admit, that a sufficient number of the best adapted plants and animals have not been created on oceanic islands; for man has unintentionally stocked them from various sources far more fully and perfectly than has nature (Darwin, 1859, p. 390).
>
> Certain facts however do not fit the theory of creation satisfactorily. The rapid spread of the rabbit in Australia after its introduction by man has proved that there was no obvious reason why the rabbit should not have lived there before, if congenial surroundings were all that was required. House sparrows have spread widely through North and South America; frogs which were once absent from the Azores attained plague proportions; the grey squirrel of America has proved more successful than the native British red squirrel and is slowly supplanting it (George, 1962, p. 33).
>
> Why, for example, should Australia be populated by marsupial versions of the wolf, the mole, the squirrel, and the mouse, rather than by the real articles? Why should oceanic islands lack most kinds of animals except for those few whose features suggested an ability to cross great expanses of ocean? Why should there be a woodpecker in the Argentine pampas, and hardly any trees for hundreds of miles? Why, as Darwin found in the Galapagos Islands, should the economy of nature be filled by a host of similar species of finches, each slightly modified for an ecological role that birds like warblers, parrots, and woodpeckers play in South America? In general, it appeared that a given taxonomic group of species was not distributed throughout the world wherever its special habitat occurred, as an economical Creator might have ordained (Futuyma, 1983, pp. 50–51).

The theological source for evolutionists' understanding of God was Darwin himself. Since the publication of the *Origin of Species*, evolutionists have rehashed the same talking points of Darwin. But, where did Darwin get his understanding of God? It appears that Darwin's attack was on the progressive creation/multiple centers of origin and local flood theory of Louis Agassiz (1850). Historically, though, the creationist position has been one of contemporaneous creation and a universal flood where all land animals and birds were dispersed from the mountains of Ararat.

From this single point of origin, why must "the best adapted plants and animals" be stocked on oceanic islands? Why must rabbits exist on every continent or island that suits them? Why does a woodpecker not have the freedom to migrate wherever circumstance leads it? Why do species (i.e., finches) not have the freedom to cross barriers and colonize islands like the Galapagos? And why, as Edward Dodson (1976) suggests, are discontinuous distributions evidence against creation, but explicable on a theory of evolution? "Often the creationist position," writes one evolutionist, "seems merely a straw man—set up only to be knocked down" (Gale, 1982, p. 139).

Contrary to the claims of Coyne and other evolutionists, the argument from biogeography does not prove evolution. Nor does it disprove creation. The whole structure of evolution, with its long time and progressive speciation does not bode well with the wide distributions existing in the world. To make sense out of biogeography, evolutionists are forced to build up and tear down continents and islands, disperse plants and animals across vast stretches of ocean in a way that can only be described as miraculous, and then misrepresent alternative theories to make theirs more attractive.

A much better way to explain the geography of life exists without resorting to miracles. Like evolution, creation also has multiple ways of explaining every distribution, rendering both theories unfalsifiable. However, while creation and evolution are equivalent in this respect, the distribution of life is best explained by a theory of contemporaneous creation and a universal flood.

Transportation by Human Agency

The creationist view has always maintained that from his inception man was endowed with great intelligence, ingenuity, and technological abilities. Humans made numerous voyages across our great oceans long before Columbus. Most of the biogeographical enigmas that haunt evolutionists can be easily explained by this view.

The most convincing evidence for these transoceanic voyages comes from archaeology. The American continents, especially North America, have turned up numerous ancient coins from such places as China, Rome, Greece, and Egypt (Mahan and Braithwaite, 1975; Epstein et al., 1980). These coins cannot be easily dismissed as "recently lost" for several reasons: (1) Some coins have been found in undisturbed soil twenty-five feet deep (Deans, 1884) or in ancient Indian gravesites with stone tools found in the same locality (Butler, 1886); and (2) Chinese coins are confined to the west coast (i.e., Oregon and British Columbia), whereas Roman coins are east of the Mississippi, a pattern you would not expect to see if the coins were randomly dropped in modern times.

Archaeologists in Central America also have unearthed evidence for pre-Columbian contact from Africa, Asia, and Europe. Many large stone heads (some 9 feet high and 22 feet in circumference) from southeastern Mexico display clear negroid characteristics (Stirling, 1940; Von Wuthenau, 1975). The same Olmec culture also produced a two-foot-high basalt statuette of an oriental man, which is presently housed in a Mexico City museum (Coe and Miller, 2004). And recently, a rediscovered black terracotta head from the 1930s identified as European was dated to be 1800 years old (Knight, 2000).

The traditions of the Polynesian people also support long sea journeys. Anthropologist Roland Dixon documented the types of canoes used and their varying lengths (some were 90 feet long and could accommodate as many as 100 people). He also documented the distances of many of their excursions (Dixon, 1934). Tangiia, a man from Fiji, traveled as far as 4,000 miles to Rapanui—the native name for Easter Island (Dixon, 1934). Many others made these long excursions, including Paao priest of Upolu in the Samoan Islands, who traveled a distance of 2,300 miles to Hawaii (Emerson, 1893). Had the early explorers reached as far as Easter Island and Hawaii, the journey eastward to America would not have been difficult.

> The proven skill and daring of the Polynesian navigators within the area of Polynesia itself have naturally suggested that they may well have made adventurous voyages beyond the eastern margin of Polynesia, and so reached the shores of the New World. Such theories have been largely used in attempting to account for the presence of certain cultural traits which have analogies, real or fancied, with traits in the Oceanic area. Since Hawaii and Easter Island lie within less than 2500 miles of the Californian and Peruvian coasts respectively, the voyage thither would have been within the compass of the Polynesian sailor (Dixon, 1934, pp. 171–172).

Early humans traveled often and far for exploration, trade, and colonization. Couple this with G. G. Simpson's (1940) observation that people have always had a fascination with animals from distant places, and creationists can explain not only island distributions but even continental ones. It is far more reasonable to believe that some of Hawaii's fauna and flora arrived from southeastern Polynesia carried by humans, or that an early Polynesian explorer took back to Fiji the banded iguana than it is to believe that they transported themselves. Even some evolutionists accept this approach and have recently argued that the arrival of the coconut (Ward and Brookfield, 1992) and the Polynesian chicken in America are best explained by human transportation (Storey et al., 2007).

Furthermore, we see the same human transportations and colonizations occurring today. A multitude of books and articles have been written that show how plants and animals have colonized new and distant places and the problems this fact presents for indigenous species (Groves and Di Castri, 1991; Boersma, 2006). For example, much of Hawaii's present flora has been recently introduced by humans from all parts of the world.

> The Hawaiian Islands face a huge problem from plant invaders. There are simply too many of them to list them all in a small guide such as this, and singling out a few more for brief mention here does not do justice to the full scope and scale of the problem. There have been more than 10,000 species of alien plants introduced to the islands from all parts of the world, most of them intentionally and a few by accident. Just how many of these species are invasive remains to be seen; there are already more than 1,000 naturalized plant species reported in the Hawaiian Islands and a recent summary of the invasive or potentially invasive garden plants in the Islands listed 469 species (Staples and Cowie, 2001, p. 98).

Other colonizations occur through the releasing of many exotic pets into the wild. The Burmese and the vicious African Rock python, which are indigenous to Southeast Asia and sub-Saharan Africa respectively, have effectively colonized southern Florida, and many fear that they will soon colonize the other southern states (Fleshler, 2009; Reid, 2010; Tennesen, 2010). If, several hundred years from now, scientists do not trust the written record (as is true today) and want to explain these distributions naturalistically, then these incredible disjunctions (over eight thousand miles in the case of the Burmese python and three thousand for the African Rock) would have to be explained by rafting or some sort of land-bridge.

Humans have had a tremendous impact on the distribution of life, especially on islands. While other factors made a contribution, such as ocean currents, bird ferrying, and probably some short-distance rafting, they are likely trivial compared with transportation by human agency.

Postdiluvian Dispersal of Land Animals

One creationist view is that the continental dispersal of most land animals and birds was an unaided process. Marsupials, monotremes, and other animals dispersed themselves from a Middle-Eastern starting point to their present locations, a view considered ludicrous by evolutionists. Coyne, for example, believes that insurmountable barriers had to be crossed for marsupials to reach Australia. "How did kangaroos and giant earthworms make their way across the oceans to their present home in Australia?" (Coyne, 2009, p. 89). Contrary to the evolutionist claims, creation is not only consistent with the facts, but also provides a much simpler and non-miraculous explanation for continental distributions.

How exactly did marsupials get to Australia, and why are they mostly confined to this continent? Creationists have utilized two slightly different ways to explain these distributions, depending on when they believe continental drift took place. Some creationists have suggested that the continents were separated during the Flood and that marsupials got to Australia either by a land connection (i.e., since this area is still tectonically active) or by island hopping/rafting. This was followed by an extinction of marsupials in Asia. This view should not be ridiculed, especially since this was the *dominant* explanation given by evolutionists up until the acceptance of plate tectonics: marsupials "must have reached Australia through rafting and island-hopping … along an archipelago between Asia and Australia and then died out in southeastern Asia" (Clemens, 1968, p. 15).

Although this creationist view of dispersal is capable of explaining the existing biogeography, it has some difficulties. Other creationists believe the continents were still united after the Flood and every animal was more or less widely distributed, some even reaching as far as North America. Almost 400 years after the Flood, the continents separated (cf. Gen. 10:25), and some animals (e.g., marsupials) were spared the competition that their close cousins were suffering in other parts of the world (e.g., Asia). Due to competition, as well as other environmental factors, some members of a species died out while others flourished. What are seen are not evolutionary centers of origin followed by miraculous dispersals, but relicts, or survivors, of a once wide continuous range.

So simple and compelling is this method of dispersal that evolutionists have flirted with what is essentially a creationist explanation. Aaron Franklin Shull, a University of Michigan zoologist, wrote:

> These early northern mammals [marsupials] spread over the world, in all directions. They could not go far to the north before striking impossible climate, but the path south was open all the way to the tips of Africa and South America and through Australia. Then the true higher mammals [placentals] began to arise, also in the northern continents. They proved to be superior to the marsupials in the struggle for existence and drove the marsupials out—that is, forced them southward. Australia was then connected by land with Asia, so that it could receive the fugitives … Behind them the true mammals [placentals] were coming; but before the latter reached Australia, that continent was separated from Asia, and the primitive types to the south were protected from further competition (Shull, 1951, p. 60).

This simple way of explaining animal distributions (i.e., moving continents rather than animals) is explicable only by a theory of contemporaneous creation; that is, where *all* animals were present and widely distributed before the fragmentation of the world's landmasses. Furthermore, the empirical evidence for a more or less widespread distribution becomes more impressive with each passing year. Prior to 1985, there was no evidence for marsupials anywhere but Australia and the New World, and evolutionists took this absence of evidence as evidence of absence, but now marsupial fossils have turned up in many unexpected places, including Africa (Bown and Simons, 1984), Madagascar (Krause, 2001), and even Asia (Benton, 1985; Ducrocq et al., 1992).

We are discovering that more animals are proving to have a wider distribution than previously thought. The monotremes (e.g., platypus, spiny anteaters) were for the longest time believed to have been confined to Australia, yet to the amazement of many, a monotreme fossil was discovered in the early 1990s in South America (Pascual et al., 1992). Even elephants were far more widespread than evolutionists were willing to admit. Elephant remains (i.e., bones, teeth) and man-made objects of elephants also place this creature in southern Mexico (Anonymous, 1903; Nomland, 1932), South America (White, 1884; Carter, 1989), and even possibly Australia (Vickers-Rich and Archbold, 1991).

As noted, discontinuities are due to partial extinctions, and in time more extinctions will shrink distributions. Not only are marsupials and monotremes today confined to a place or two, but the only locations of wild elephant herds are Africa and South Asia. The same locations apply to the once widespread lion. Due to big game hunters, both the elephant and the lion are now endangered species even in these areas, with the African lion facing extinction within twenty years unless precautions are taken.

Another factor that increases the chances of extinction is human introductions. In addition to the invasive Burmese python, an untold number of introduced foreign species are exterminating indigenous species, such as the Gambian rat in Florida (Perry et al., 2006), chameleons in Hawaii (Staples and Cowie, 2001), and the brown tree snake in Guam (Conry, 1988). Thanks to human hands, even the cichlids are expanding their range. They are outcompeting many native species (e.g., crustaceans) and have effectively colonized many freshwater habitats in the Hawaiian Islands (Staples and Cowie, 2001). As more exotic animals escape or are released in the wild, some will colonize these locations and force others into extinction.

Contrary to evolutionary claims, the random-appearing and discontinuous patterns of distribution seen in the world today are quite consistent with a creationist view. And the advantage the creationist view has over the evolutionist one is that it does not require miraculous, long-distance, over-water dispersal. All that is required is a more or less wide distribution followed by tectonic vicariance and extinctions in the intermediate range of these wide distributions.

Survival and Dispersal of Plants

Up until the time of the Flood, the world was lush with vegetation. All kinds of fruits, vegetables, flowering plants, and numerous other plant species were widely distributed on Pangaea. This tropical paradise was completely destroyed by the Flood, and only some species of plants, through the survival of their seed, succeeded in leaving representation in the postdiluvian world.

The survival of seeds during the Flood has been questioned by those who doubt the biblical narrative. There are, however, various ways seeds could have survived the Flood. (1) Many seeds can remain dormant for very long periods of time, in some cases as long as 1500–2000 years (Shen-Miller et al., 1995; Erlanger, 2005). (2) Plants of all kinds would have been brought into the ark to feed animals and people during the Flood. After the Flood Noah and his family could have used the seeds to harvest their favorite foods. (3) Seeds could have survived on floating mats.

After the Floodwaters abated, seeds were scattered over the face of the earth, and as time ensued further dispersal occurred by other means: epizoochory (i.e., dispersal of seeds attached to animals' bodies), endozoochory (i.e., dispersal of seeds inside animals' bodies), and autochory (i.e., dispersal by physical expulsion and wind). Add this to human interest in many plants (e.g., fruits, vegetables, angiosperms) and our ability to facilitate dispersal, and it is safe to predict that at the time the continents were divided many plant species were widely distributed wherever favorable climates were present.

The evidence from archaeology provides overwhelming support for a wide distribution of plants, especially fruits and vegetables. The pineapple, for example, was widespread in South and Central America when Columbus and other explorers came to the New World (Collins, 1948). As a result, it was long assumed that this fruit originated in Brazil until a wealth of archaeological evidence confirmed that the pineapple also existed in the Old World from very early times. The pineapple is clearly depicted in old Indian temple art (Gupta, 1996), found on pottery in Egyptian tombs (Wilkinson, 1837), represented on murals in Pompeii (Carter, 1953), and, to the amazement of nineteenth-century archaeologists, the pineapple was carved on walls in ancient Nineveh (Layard, 1853; Rawlinson, 1885). Regarding the discovery at Nineveh, George Rawlinson stated, "The representation is so exact that I can scarcely doubt the pineapple being intended" (Rawlinson, 1885).

The bottle gourd was also a widespread plant. Nobody can figure out where it originated or how it was dispersed. Archaeologists have found abundant evidence (i.e., rinds, seeds) for its early existence in many places in Peru (Whitaker and Bird, 1949; Macneish et al., 1970), in several caves in northeastern Mexico (Whitaker et al., 1957), and in an ancient burial site in central Florida (Doran et al., 1990). A clay replica of the gourd was also discovered in the eastern Andes (Izumi, 1971). The story is much the same in the Old World. The gourd appears in ancient Egyptian tombs (Schweinfurth, 1884), a cave site in Kenya (Cole, 1963), Spirit Cave in northwest Thailand (Gorman, 1971), and its usages (i.e., bottle, eating utensils) are mentioned in an ancient Chinese document (Li, 1969).

The peanut was once believed to have originated in the Old World because of how widespread it is there. When archaeologists recovered peanuts from ancient Peruvian tombs, it was then believed that the peanut originated in South America and was carried over to

Asia in recent times. Archaeologists have recently discovered several-thousand-year-old peanuts in China (Chang, 1973) and in caves on the island of Timor, Indonesia (Glover, 1977). Like the pineapple and bottle gourd, the peanut was universal several thousand years before Columbus.

Many other plants thought "native" to one hemisphere also existed early in the other hemisphere. Ancient Indian temple art clearly depicts plants that supposedly originated in America, such as the cashew nut, custard apple, and chili pepper (Gupta, 1996). The custard apple also was discovered in caves on the island of Timor (Glover, 1977), and the chili pepper had a history in Tahiti before European contact (Langdon, 1988).

Plants shared between the pre-Columbian hemispheres were numerous. The evolutionary claims for this wide transoceanic distribution of plants is unconvincing because plants have limited mobility and are poor dispersers. Something more is needed to move them all over the earth. There have always existed some anthropologists, who boldly proclaimed that the empirical evidence stands in sharp contrast to conventional thinking.

> Some plants positively were pre-Columbian in the Old World and the New World, and at least one such transfer can be dated at about 2500 B.C. There is a formidable list of other plants, most of them related to the Middle American-Southeast Asian areas that range all the way from probable to possible cultural transfers. The long held doctrine of the absolute separation of Old World and New World agricultures is no longer tenable. The plant evidence should be re-examined without bias (Carter, 1953, p. 71).

George Carter accepts this early and wide distribution of plants as evidence of pre-Columbian contact, and in many cases he may be right. Another possibility is that the seeds of these plants survived the Flood and were sprouting on various continents as Noah and his family left the ark. Either way, the evidence squares nicely with the expectations of creationism.

Evolutionists, however, have an *a priori* commitment to naturalism; thus they are forced to explain away the evidence. They either dismiss the data as a misidentification (Harlan et al., 1973; Pickersgill, 1976), question the reliability of the stratigraphy in which the remains were found (Harlan et al., 1973; Chang, 1973), or attribute the phenomenon to convergent evolution (Richardson, 1972). Such extravagant explanations are unnecessary. All that is required to explain plant geography is the simple explanation of an early, widespread flora followed by extinction in many parts of the world.

Conclusion

How plants and animals came to be distributed over the face of the earth is a very important topic, especially when dealing with the question of origins. Both creationists and evolutionists have tried to reconcile the biogeographical data with their understanding of how history unfolded (the latter far more than the former). An extensive review of the biogeographical literature supports the conclusions of this paper.

First, biogeography does not establish the fact of evolution. Instead, evolution can explain nearly every contingency by using every conceivable method. Evolutionists first invoked land bridges, which were soon replaced by long-distance, over-water dispersal. Not long after, they moved from *oceanic rafting* to dispersal before *continental drifting*, and presently many evolutionists are returning to the rafting events that they trashed in past decades. According to one insightful evolutionist,

> Before continental drift was discovered the Darwinians explained the distribution of life on earth in terms of dispersal; after the discovery of drift they explained the same distribution without such heavy reliance on dispersal ... One is tempted to ask what observations the Darwinians can't explain (Leith, 1981, p. 539).

Evolutionists also distort and misrepresent the creationist position to give the impression that their theory is the only viable explanation. When evaluated fairly, it becomes clear that both creationists' and evolutionists' theories are unproven, make unjustifiable assumptions, and offer explanations that can only be described as *plausible*.

Second, while both views are in many respects equivalent, the creationist explanation is the better argument. The idea of a contemporaneous creation dispersed widely on the earth followed by partial extinctions is a simple approach, especially when dispersal is facilitated by humans. This view also fits with the archaeological evidence. The problem of biogeography from an evolutionary perspective is that all of life is stretched out over half a billion years, with the fragmentation of the world occurring late in the history, leaving a large percentage of plants and animals to disperse in a miraculous way.

Creationists are often chided for reliance on miracles. They require them, though only in the beginning. Evolution, however, requires them at almost every turn, especially when dealing with the geography of life. One who dislikes postulating miracles when simple explanations will do is forced to conclude that the geography of life is best explained by a theory of contemporaneous creation and a universal flood.

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The Little Ice Age in the North Atlantic Region

Part III: Iceland

Peter Klevberg, Michael J. Oard*

Abstract

The first two parts of this series (Klevberg and Oard, 2011a, 2011b) introduced methods of studying past climate change, the historicity of the Medieval Warm Period and Little Ice Age, and the importance of the Little Ice Age in understanding climate change and constraining climatic models. The reasons for concentrating on the North Atlantic region include the richness of the historiography for the period and the utility of the geography in studying climatic constraints on the inferred postdiluvial ice age. Nowhere is the historiography richer or the geographic setting better for this than Iceland. This paper summarizes observations of climate change in Iceland from *Landnám* to the present and the contemporary glacial fluctuations.

Why Iceland Is Special to Paleoclimatology

Iceland is exceptionally sensitive to climate change, being on the edge of the Arctic, and it is also a good indicator of European climate generally (Grove, 1988). "Iceland is ideally located to study the timing of [Little Ice Age] glacier fluctuations due to its position astride the atmospheric convergence zone and its proximity to the oceanic polar front" (McKinzey et al., 2005, p. 171). It is widely believed that effects of climate change are greater with increasing latitude (Ives, 2007).

Iceland has an unparalleled historiography, beginning with the sagas from the time of *Landnám* and extending through medieval times (Fell, 1999). (*Landnám* refers to settlement of a previously uninhabited country. In the case of Iceland, *Landnám* occurred from about AD 870 to 930). "The sensitivity of the economy to climatic fluctuations, together with the extraordinary literary bent of the Icelanders and the emergence of a line of gifted field scientists (Þórarinsson, 1960), mean that the Icelandic records relating to the Little Ice Age are of substantial length and richness" (Grove, 1988, p. 15).

Iceland's climate is greatly influenced by ocean currents and the salinity changes and atmospheric circulation patterns that drive them (Grove, 1988). Its latitude and maritime setting (Figure 1) make it a suitable laboratory for investigation of any postulated previous ice age.

As Iceland plays such a prominent role in studies of the Little Ice Age, this paper (Part III) is devoted solely to this country. Vatnajökull (Figure 2) and other major glaciers of Iceland are shown on Figure 3.

Prehistoric Iceland

Traditional speculations regarding the prehistoric (i.e., pre-*Landnám*) period, which are unrestrained by historical

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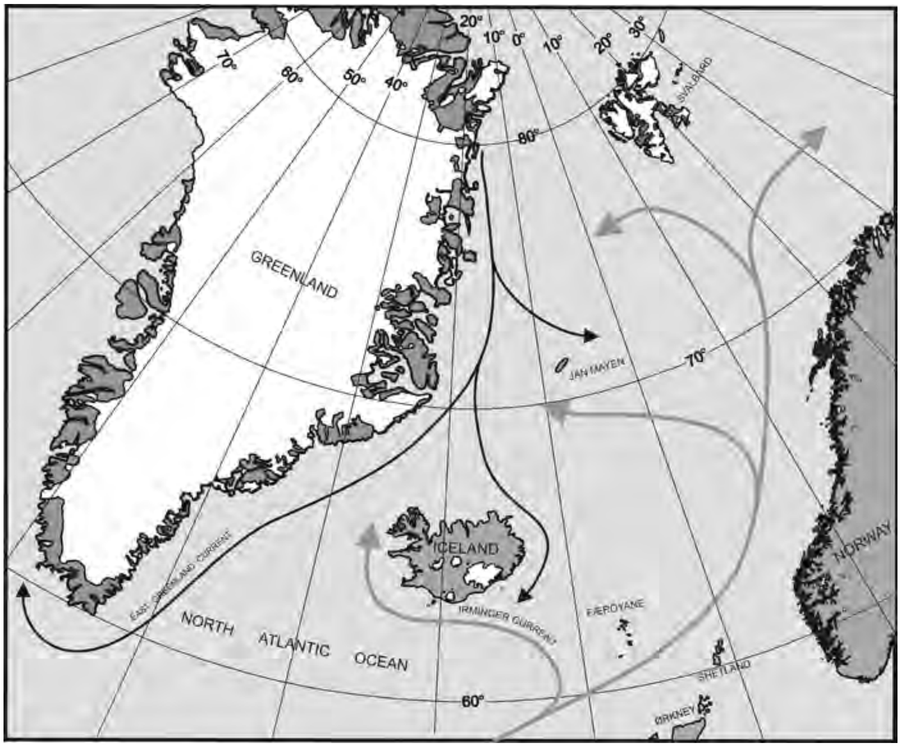

Figure 1. The North Atlantic Region. Relatively warm ocean currents are shown in gray, cold currents in black.

sources, include multiple glaciations and belief that nearly the entire island group was covered with ice during the "Pleistocene" glaciation (Björnsson, 1980; Haberle, 1991; Hjartarson, 1991; Ingólfson, 1991; Norðdahl, 1991; Pétursson, 1991; Stötter, 1991). Traditional ideas are summarized in Table I.

The Saga Age and Medieval Warm Period

Saga age is the term commonly used for Iceland's early history, from *Landnám* to about 1030. During this period, history was conveyed via oral tradition, and was not written down until medieval times. The validity of these sagas as historical references has been greatly debated (see Appendix B), but they contain invaluable insights into contemporary climate. Those sagas that fit the historical genre have generally proven reliable when archaeological and other evidence is available for comparison. We have made use of several of these references as indicated in Table II.

Historical descriptions are corroborated by jökullhlaup evidence from Skeiðarárjökull (Figures 2, 3, and 9); the nature of these glacial outburst floods is indicative of a thinner glacier according to Grove (1988). The existence of good farmland in areas that are now denuded and barren indicates considerable time had elapsed since any previous glaciation for thorough soil development (Table III). During *Landnám*, the southern Vatnajökull outlet glaciers are thought to have been approximately 20 km behind their present margins (Evans and Twigg, 2002). Glacier positions prior to the Little Ice Age argue for a climate at least as warm, and quite possibly warmer, than today (Ives, 2007). The climate prior to about 1200 was evidently warmer than after 1200 (Fell, 1999).

Icelandic Evidence for the Medieval Warm Period

Probably 85 percent of Icelandic land area was forested at *Landnám* (Landnåmsboken, 1997), mostly in scrub

Figure 2. View toward Vatnajökull from Skeiðarársandur. On a volume basis, Vatnajökull is the world's third largest ice cap (or first, if Greenland and Antarctica are capped by ice *sheets*).

Speculative Time (years before present)	Corrected* ^{14}C (median years b.p.)	Vegetation (Principally Pollen)	Inferred Temperature	Remarks	References
ca. 14 Ma	Outside range typically "dated" using ^{14}C.	*Sequoia, Pinus, Juglans, Alnus, Fagus, Ulmus, Tilia, Vitis*		Selúrdalur flora; *Taxodiceæe* give way to *Pinaceæe*	Símonarson
14 - 13 Ma		*Abies, Sequoia, Comptonia, Betula prisca, Acer, Alnus, Magnolia, Sassafras*		Brúnslækur flora; *Pinaceæe* give way to *Toxodiceæe*	Símonarson
13 - 10 Ma		gymnosperms give way to angiosperms		Gerpir flora	Símonarson
10 - 9 Ma		*Polypodiceæe* predominate; *Osmunda, Salix, Juglans, Betula, Acer, Magnolia, Carya*		Húsavikurleif flora, Tröllatunga flora, Hólmatindur flora	Símonarson
9 - 8 Ma		*Alnus, Betula, Acer, Pterocarya, Fagus, Corylus*		Mókollsdalur flora, warm-temperate flora similar to North American Eastern Deciduous Forest	Símonarson
7 Ma		*Betula, Salix*, conifers		Hreðavatn flora	Símonarson
6 - 3 Ma		*Betula, Salix*, shrubs and grasses		Sleggjulækur flora, Tjörnes flora	Símonarson
3.1 - 2 Ma		*Alnus, Betula, Salix*, grasses	Similar to today during interglacials, 5 - 10 °C colder during glacials	Extinction of temperate conifers and deciduous trees during glaciation	Símonarson
2 - 1 Ma		*Alnus, Betula, Salix*, grasses		Bakkabrúnir flora	Símonarson
ca. 1.1 Ma - 700,000		*Alnus?* and *Betula*		*Pinus* becomes extinct; Stöð flora	Símonarson
700,000 - 12,500				Wechselian glacial maximum at ca. 18,000 B.P.	Norðdahl
12,500 - 12,000	5075			Álftanes (Older Dryas); ice remained on western and northern coasts	Björnsson
12,000 - 11,000	5042			Alleröd Interstadial	Björnsson
11,000 - 10,000	4999			Búði, Álftanes? (Younger Dryas), most of Iceland glaciated	Björnsson, Hjartarson
10,000 - 9,000	4946	*Betula* maximum in northern Iceland, no *Betula* in southern Iceland		Búði?; refugia in northern Iceland, rapid near disappearance of ice	Símonarson, Hjartarson, Björnsson

Speculative Time (years before present)	Corrected* ^{14}C (median years b.p.)	Vegetation (Principally Pollen)	Inferred Temperature	Remarks	References
9,000 or 6,700 - 6,000	4807	*Betula* expanded rapidly into southern Iceland; *Betula* maximum	annual mean ca. 2 °C higher than today	Boreal and Lower Atlantic in Europe; final deglaciation ca. 10,500/9,650 B.P.	Simonarson, Wastl et al., Norðdahl, Pétursson
6,500 - 5,000 or ca. 3,300	4312	*Betula* minimum, bogs increased, *Sphagnum* maximum	slightly warmer than today	Wet Atlantic of continental Europe	Simonarson, Wastl et al.
5,000 - 2,500	3640	Second *Betula* maximum (50%+ of country)	annual mean temperature 2 - 3 °C warmer than today	Sub-boreal of continental Europe, somewhat lower precipitation and milder winters, possibly 3m higher sea level	Símonarson
2,500 - ca. 1,500	2000	*Betula* declined, bogs increased		"climatic deterioration," "Subatlantic time," glacial advances only exceeded by Little Ice Age, E.L.A. depressed ca. 5 m	Björnsson, Haberle, Símonarson
ca. 500 - 870 A.D.	1350	*Betula* declined, bogs increased		"climatic improvement"	
870 A.D. ff.	550	Sharp decrease in *Betula*, increase in grasses		cultural indicators, soil erosion commences	Símonarson

*"corrected" using Brown (2006) without examining the many variables (e.g. marine reservoir) of each specific sample; "corrected" years are for initial comparison purposes only.

Table I. Traditional (uniformitarian) inferred paleoclimatology of Iceland (Simonarson, 1980; Norodahl, 1991; Bjornsson, 1980; Haberle, 1991; Hjartarson, 1991; Petursson, 1991).

woodland of dwarf birch (*Betula pubescens tortuosa*). *Dwarf birch* is a common English name for the subspecies of Downy Birch (*Betula pubescens*), which grows in the Arctic and typically reaches only about 5 to 6 m (15 to 20 feet) in mature height (Figure 4). The climate must have been milder than at present for some time for woodland to become so well established, especially trees much larger and straighter than the largest *Betula pubescens* that have survived in Iceland (Landnåmsboken, 1997). Trees are frequently mentioned from all parts of the country (Landnåmsboken, 1997). Even on the north coast, the woods were high enough to completely hide horses and other livestock (Landnåmsboken, 1997).

Plains were much better vegetated a thousand years ago, with more stable rivers (Ives, 2007). At *Landnám*, the *Þjórsá*, a major river in the south of Iceland, was a good anchorage, "much deeper and narrower" than it was two or three centuries later, according to *Egil's Saga* (Lie, 1951—presumably a note added by Snorri Sturlasson in his work of ca. 1250). Other inlets were good anchorages that no longer are, or that have even ceased to exist (e.g., Hjörleifshöfði, mentioned in Landnåmsboken, 1997). Such inlets and deep, stable river channels indicate a much lower rate of erosion, indicative not just of a land yet undisturbed by human activity, but also one with little glacial erosion.

On two occasions, pigs that escaped survived in the wild for one to three years and actually multiplied (Landnåmsboken, 1997). One of these locations was on the west coast, the other on the north.

Source	Modernized Name (in Norwegian)	Approximate Years Covered
Iceland		
Landnámboka	Landnåmboka	870–930
Egils saga	Egils soga	840–995
Brennu-Njáls saga	Njåls soga	975–1015
Kormáks saga	Kormaks soga	875–965
Laxdæla saga	Laksdøla soga	865–1035
Hrafnkels saga Freysgoða	Soga om Ramnkjell Frøysgoda	900–950
þórgills og Havlide	Soga om Torgills og Havlide	ca. 1000's?
Gunnlaugs saga ormstungu	Soga om Gunnlaug Ormstunge	965–1025
þórðar saga hreðu	Soga om Tord den Hardbalne	850–1050
Greenland		
Grænlendinga saga	Grønlendinge soga	985–1025 (1100's ?)
Eiríks saga Rauða	Eiriks soga/Soga om Eirik Raude	985–1025 (1200)
Grönlands Þáttr	Grønlands tåtr	1120–1130

Dates in parentheses may be approximately when sagas recorded in Iceland.

Table II. Historical Sources

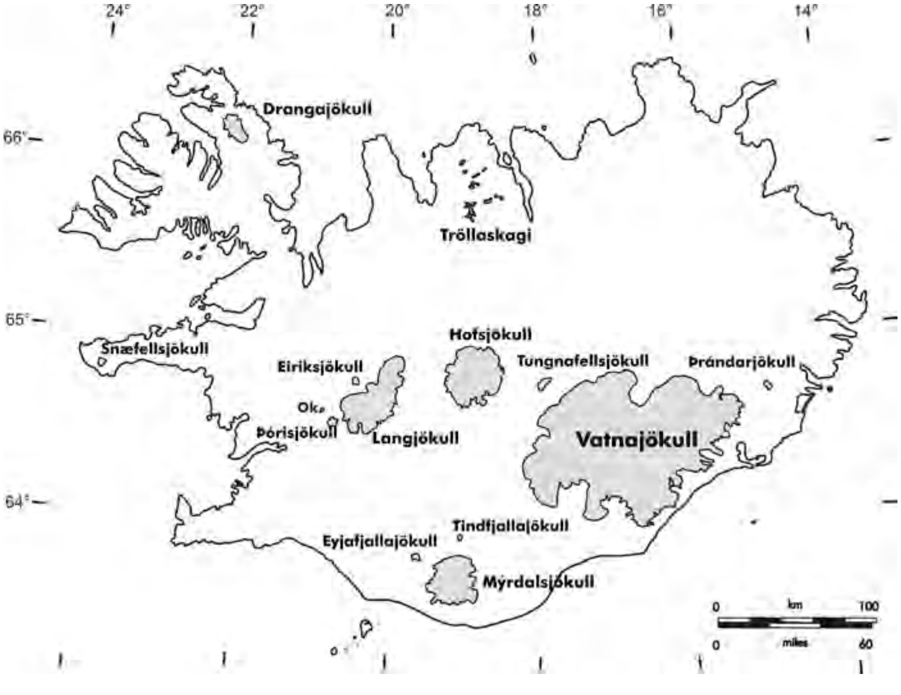

Figure 3. The principal glaciers of Iceland.

While the pigs raised in medieval times were smaller, longer-legged, and hairier than those raised today (Bjørvik, 1994), they could not be expected to survive in the current climate. Icelanders are accustomed to eating considerable lamb and horsemeat rather than beef or pork, since sheep and horses survive better than cattle (and certainly swine!) in the open fields. Cases of sheep and horses escaping and thriving are less problematic and could even be imagined occurring today.

Farms were prosperous at higher elevations than are possible today. For example, *Hrafnkels soga freysgoða* (Saga of Ramnkjell Frøysgoða), while it has its errors and its critics (Pálsson, 2000), clearly indicates the presence of a prosperous farm in eastern Iceland at too high an elevation for today's climate (Figure 5).

Grain is a more precise indicator of climate. Whether Havranes was a place where oats were grown or simply sold or eaten is unclear. However, that grain was not merely imported but was regularly grown from *Landnám* on is clear. Egil Skalligrimsson (Figure 5) grew grain in the Borgarfjörður area on the west coast (Lie, 1951). Reliable grain harvests were known from nearby Rekjahólar on Barðastrand, based on the Saga of Þórgills and Havlide (Pálsson, 2000). Grain (probably barley) was grown in north-central Iceland near Mývatn, since "Glum murdered Torkjell the Lofty in the grainfield" (Landnåmsboken, 1997, p. 130). Grain was grown at Liðarendi, some distance from the coast in southern Iceland (Liestøl and Hagland, 2003). Grove (1988) asserts that grain was grown in northern and eastern Iceland, as well as southern and western parts of the country, prior to the Little Ice Age. As pointed out in Part II of this series (Kleverg and Oard, 2011b), only in recent decades has it become possible to grow grain again in Iceland, and then only in part of its former range.

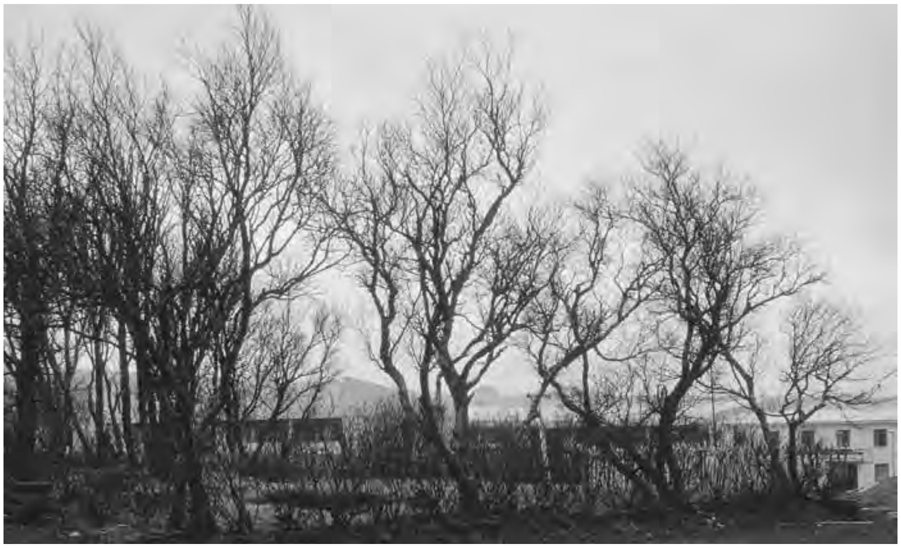

Figure 4. *Betula pubescens tortuosa* at Reykhólt, western Iceland. These are old trees about 5 m (16 feet) tall.

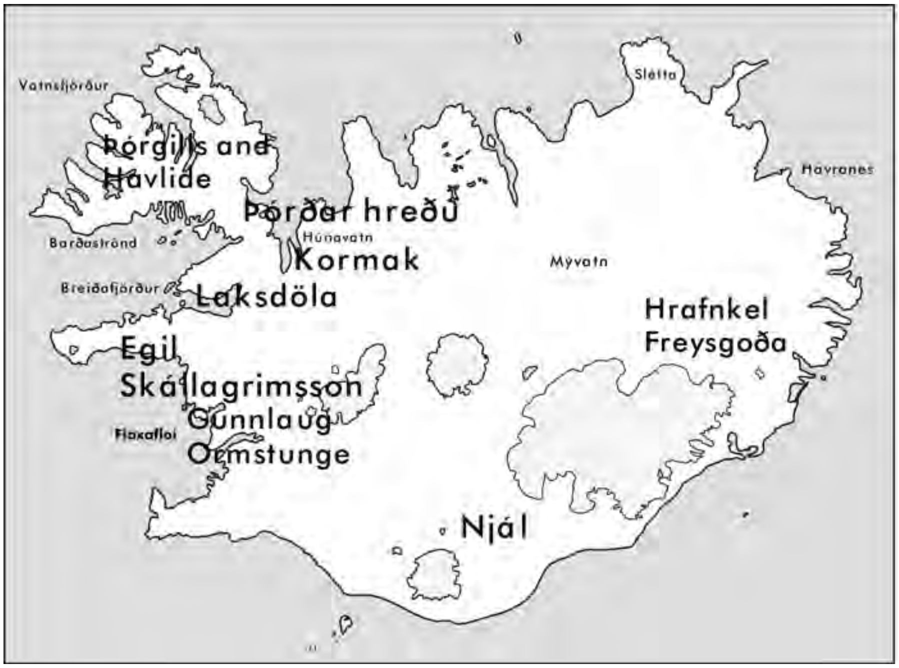

Figure 5. Locales of some important Icelandic sagas.

Evidence that the Medieval Warm Period Was Only Slightly Warmer than Today

While the evidence is strong that the Medieval Warm Period was at least as warm as today and probably warmer, it is important to also note the evidence that it was not markedly warmer. It is also important to keep in mind that many factors influence climate, and many combinations are possible. For example, development of a more "continental" climate in a particular location could result in a series of years with harsh winters in conjunction with summers that are slightly warmer and longer than normal and thus provide good growing seasons. Cold winters and cold summers could combine with dry conditions that result in negligible growth of glaciers. Climatology is beset by many variables and complexities, and it is important not to emphasize some of the data at the expense of others.

The first recorded visitors to Iceland were Irish monks in AD 765 who, according to their contemporary Dicuil, encountered sea ice one day's sailing north along the coast (Krag, 1994). At the time of its discovery, Iceland was called "Sneland," or "Land of Snow," suggesting the climate was not dramatically warmer than today (Landnåmsboken, 1997). Floke Vilgerðarsson and his group of explorers gave Iceland its name after overwintering on Vatnsfjörður. They found the spring "rather cold" and named the country after Vilgerðarsson observed ice flows in a fjord to the north (Landnåmsboken, 1997). While glaciers did not extend as far as they have since, several are mentioned. Snow and cold ocean breezes are mentioned in accounts from the north coast in the spring of the year. Helge the Gaunt and his entourage on the north coast had "a difficult first winter" (Landnåmsboken, 1997, p. 120), and it should be remembered when reading these contemporary accounts of Icelandic climate that the settlers were largely Norwegians, not people from the countries of the balmy south.

Although most of the Icelandic mainland was forested at *Landnám*, most of this was apparently scrub woodland of dwarf birch (*Betula pubescens toruosa*), or at least such is certainly mentioned from the earliest records (Landnåmsboken, 1997). That the forest was largely scrub woodland of this type is attested to by the need to import timber. Grantrenes ("Spruce Tree

Point"), in Breiðafjörður on the west coast, was not named for native trees but for an enormous (4-m diameter by 40-m long) spruce log that drifted there. Both Furufjörður and Furuvík are on the north coast, though whether any *Pinus* grew there, we do not know (we think not). *Pinus* was apparently native to Greenland before the Great Ice Age (Dahl-Jensen, 2004); at least some evolutionists claim *Pinus* became extinct in Iceland "about one million years ago" (Símonarson, 1980, p.173). Uprooted trees from Siberia provide a source of driftwood in Iceland (Ives, 2007), but these would be primarily *Picea* from Asia, while native species of both flora and fauna in Iceland are unequivocally European! Unequivocal evidence for growth of *Picea* or *Pinus* prior to planting efforts of the past century is not known.

Not all of the farms mentioned in the sagas at relatively high elevations are indicative of warmer conditions. As indicated in *Egil's Saga* (Lie, 1951) and *Gunnlaug Ormstunga's Saga* (Kent, 1928), some of these were *sæter* farms, areas used as summer range for livestock. *Sæterbruk* and abandonment due to soil erosion may explain a significant percentage of the former farms at higher elevations (Sveinbjarnardóttir, 1991).

While *Landnámsboka* (aka *Landnåmsboken*) indicates bears were not common in Iceland and perhaps had never been resident, ice had apparently come to the north coast in adequate size and quantity to transport polar bears (*Ursa maritimus*), since one killed Odd Argeirsson's father and brother in a blizzard on Sletta (he killed the bear) in the tenth century (Landnåmsboken, 1997). The only other account of *Ursa maritimus* we are aware of was a sow and cub captured by Ingemund the Old by Húnavatn, also on the north coast. Polar bears have travelled to the country on ice floes from Greenland during recent centuries.

The saga of Þórðer Hardbalne (Hagland, 2004) mentions winter experiences with plenty of snow and "good ice" on Midtfjörður. Cold years were also reported for Norway in the late 900s and the 1030s (Krag, 1994) from the same latitude as Iceland. However, usable pastureland in Norway during the period AD 800–1100 was two to four times the modern value (Helle, 1994), so these cold years appear to have been the exception rather than the rule in the North Atlantic region. If climatic conditions were significantly different in the two countries, it is certain the difference would have been mentioned in the sagas, but they seem to have been similar. The evidence, taken together, thus seems to indicate conditions that were generally more clement than today during the Medieval Warm Period but did not differ greatly from today and included many of the same variations in weather, including cold winters, which have occurred during the modern instrumental period.

Microclimatic Considerations

At *Landnám*, Iceland was largely forested, "from sea to mountaintop" (Landnåmsboken, 1997). Forest cover would have moderated the climate, though it also suggests the climate had been milder than at present for some time for woodland to become so well established, especially trees much larger than the largest surviving *Betula pubescens tortuosa*. "Deforestation in Iceland combined with climatic deterioration to exacerbate the crisis" (Bjørvik, 1994, p. 35).

The Little Ice Age Commences

Climatic deterioration apparently began in the 1180s (Ogilvie, 1984) or 1200s (Grove, 1988). Cereal grains could no longer be cultivated in northern and eastern Iceland after 1300, and barley was limited to only a few south coast locales, and Flaxifloí on the west coast (Figure 5) in 1350; it was limited to a few spots on the south shore of Flaxifloí thereafter and ceased altogether before 1600 (Grove, 1988).

Ice advanced from all the ice caps and major glaciers in Iceland. While reverse oscillation between Drangajökull and Eiríksjökull in the northwest (Figure 3) and Vatnajökull and Mýrdalsjökull in the southeast is a normal weather pattern (Guðmundsson, 1998), this was not observed during late medieval times. Vatnajökull and Mýrdalsjökull (Figure 6) receive moisture from the relatively warm Irminger Current (Figure 1), in

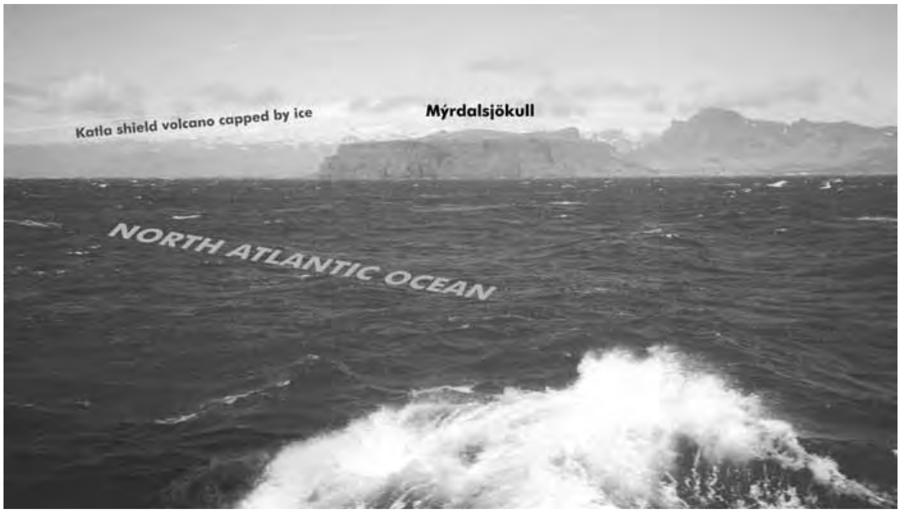

Figure 6. Mýrdalsjökull from the sea. This ice cap overlies the shield volcano Katla (light gray outline) and surrounding ridges. The relatively warm Irminger Current provides moisture to Mýrdalsjökull and Vatnajökull.

Farm or Settlement	Location	Glacier	Date Overrun
Fjall	Southeast	Breiðamerkurjökull	ca. 1700
Breiðá			1697 - 1700
Kári Sölmundarsson's tomb			pre 1712
Breiðamerkursandur farms			ca. 1350 - 1750
Trimbilsstaðir	Northwest	Drangajökull	ca. 1600
Öldugil			ca. 1400 - 1710
Sviðningsstaðir			ca. 1700?
Þaralátursfjörður valley			ca. 1450 - 1650
Nedra Horn		Reykjafjarðarjökull	pre 1650
Fremra Horn			pre 1650

Sources: Grove, 1988; Evans and Twigg, 2002; Ives, 2007.

Table III. Farm or Settlement Overrun by Ice During Little Ice Age

contrast to the northern glaciers. Overall advance of outlet glaciers from all of these ice caps occurred during the Little Ice Age (Grove, 1988). Small plateau ice caps also appeared on the Gláma Plateau near Drangajökull and Ok near Langajökull (Figure 3) during the Little Ice Age (Björnsson, 1980). Farms known to have been overrun by ice are listed in Table III and include locations in both the northwest and southeast of the country. While some of these farms may have been destroyed prior to the arrival of the ice front by jökulhlaups or similar phenomena, these events were also closely linked with the growth of the glaciers.

In the area of Breiðamerkursandur (Figures 7, 9, and 10), Grove (1988) cites the 1772 record of Ólafsson and Pálsson, who said "many farms" were settled in this area during *Landnám* and the area was "well grassed" until 1100 or later. Breiðamörk was a wooded area on the west side of Breiðamerkurjökull. Breiðá was still prosperous in 1343, and Fjall was still being cultivated in 1387. Breiðá was still in existence in 1525 but possibly abandoned in 1697 (or possibly later). The tomb of Kári Sölmundars-

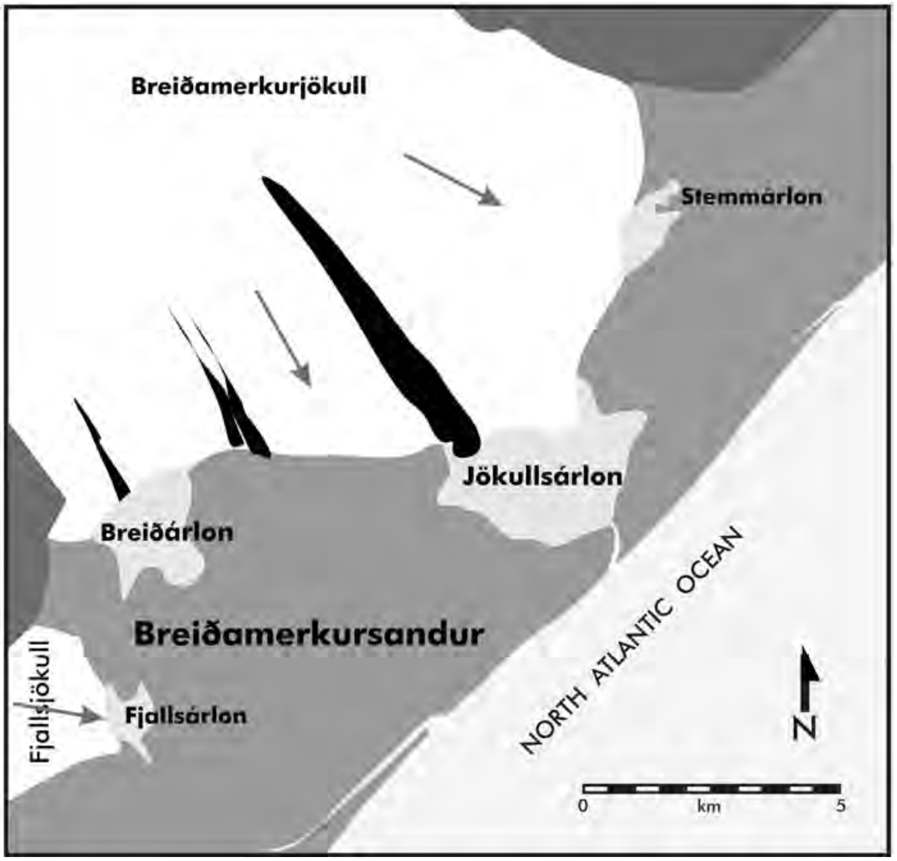

Figure 7. Breiðamerkursandur, a prominent *sandur* (seacoast glacial plain) in southern Iceland. Prominent black ridges in Breiðamerkurjökull are medial moraines. Arrows show general direction of ice flow.

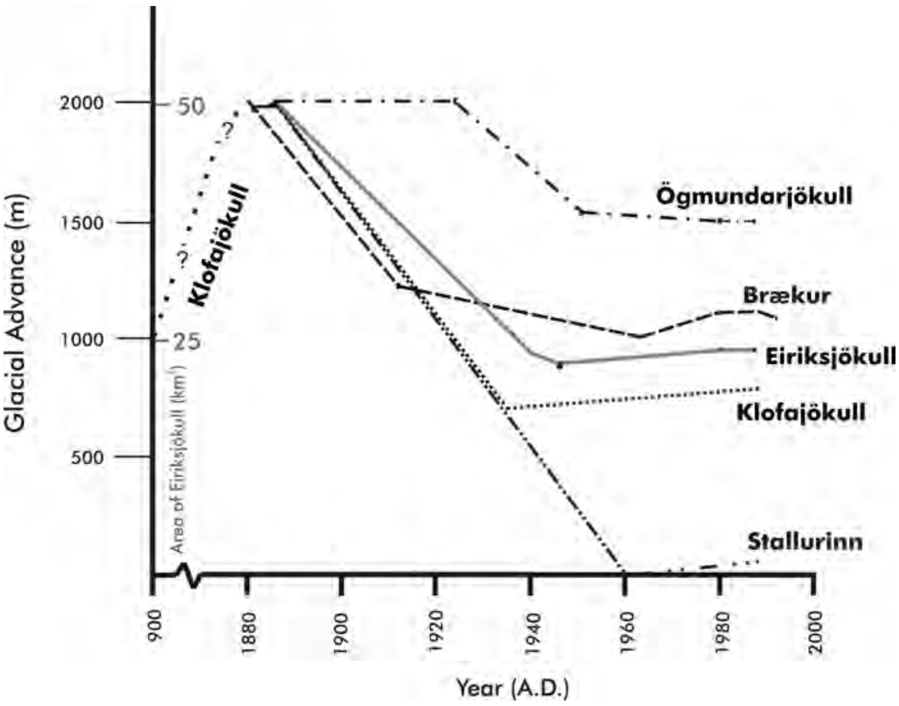

Figure 8. Fluctuations of Eiríksjökull ice cap and outlet glaciers: area of Eiríksjökull in gray, end position of outlet glaciers in black.

Year	Maximum Advance of Glacier (m)				Area of Eiriksjökull (km^2)
	Klofajökull	Brækur	Ögmundarjökull	Stallurinn	
pre 900	1,000				
1880		2,000			49.4
1885	2,000		2,000	2,000	49.4
1911		1,215			
1923			2,000		
1934	700				
1938					23.3
1945					22.0
1946			1,600		
1960				0	
1962		1,000		0	
1979		1,100	1,500		
1980					23.8
1987		1,100	1,500	50	23.8
1991		1,075			

Table IV.

son (Liestøl and Hagland, 2003) by the Breiðá church was under the ice by 1712.

As Table III shows, glacial advances were not limited to the Vatnajökull outlet glaciers. Eiríksjökull, in west-central Iceland, and Drangajökull, in the northwest (Figure 3), are not favored by the same weather systems that favor Vatnajökull (Grove, 1988; Guðmundsson, 1998), yet their fluctuations show the same basic pattern (Table IV and Figure 8). Thus, the effects of the Little Ice Age were felt throughout the country, and did not result from shifting local weather patterns.

By 1700, Hafrafell west of Öræfi (Figure 9) was inaccessible due to growth of glaciers. “It may be concluded that the Vanajökull glaciers advanced rapidly between 1690 and 1710 and were more extensive than at any time earlier in the historic period” (Grove, 1988, p. 45).

The Little Ice Age Peaks

“The most extensive glacier advance culminated for the steeper glaciers in the 1750’s, and in 1850 to 1890 for the broad lobes from the plateau ice caps” (Björnsson, 1980, p. 206). A combination of lichenometry (cf. Klevberg and Oard, 2011b, Appendix B) and tephrochronology on Vatnajökull outlet glaciers yielded a Little Ice Age maximum of 1755–1873 (McKinzey et al., 2005). Grove (1988) concludes the maximum position of Vatnajökull outlet glaciers probably occurred ca. 1760, though several were a century or more later.

Some of the best documentation comes from the Breiðamerkursandur area (Figures 7, 9, and 10). Based on what the Danish land register of 1708–1709 recorded of Fjall (Grove, 1988): “Fourteen years ago tún and ruined buildings were still to be seen, but all that is now in the ice.” The 1712 land register said, “Fjall was the name of a farm west of Breiðamörk. It is now surrounded by ice. Twelve years ago ruins could still be seen” (Grove, 1988, p. 43). The farm at Brennhólar on east

Breiðamörk was overrun by the glacier in 1753 (Evans and Twigg, 2002). A 1756 visit to the former Breiðá church site indicated the glacier was still advancing, and Breiðamerkurjökull continued to advance at up to 4–8 m/day, with advances greatly outpacing recessions, until it nearly reached the beach in the 1870s and 1890s (Grove, 1988). In 1865, it finally overtopped a large moraine (apparently from the Great Ice Age) and destroyed the farm at Fell (Evans and Twigg, 2002). The Little Ice Age was a dramatic reality for the Icelanders and brings a sober reality check to bear on popular climate change speculations.

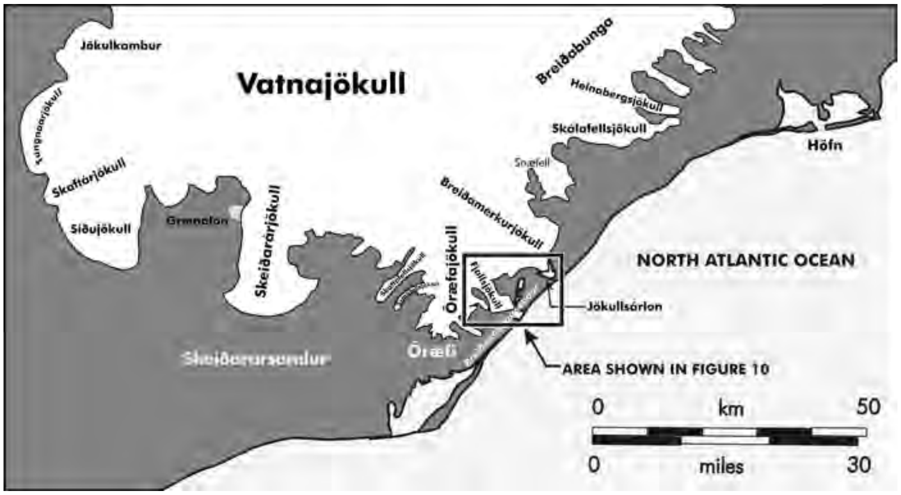

Figure 9. Map of the southern outlet glaciers of the Vatnajökull ice cap.

As explained in Part I (Klevberg and Oard, 2011a, Appendix A), the lag time of glaciers can differ greatly. Several Icelandic glaciers reached their maximum extent in the late 1800s (Grove, 1988), but this does not necessarily point to climatic complexities as lag time differences of several decades may explain this late maximum when other glaciers reached their maximum extent a century earlier. The extent reached by Vatnajökull outlet glaciers (Figure 9) during the Little Ice Age was observed by Þórárinsson to be the maximum extent of moraines on the sandur or coastal outwash plain (Grove, 1988). "The main moraines in front of the glaciers in Iceland date back to the maximum advance in the last centuries. All the proglacial landforms associated with retreating glaciers are found between the present glacier snouts and these moraines. Some of the end moraines from 1890 still have

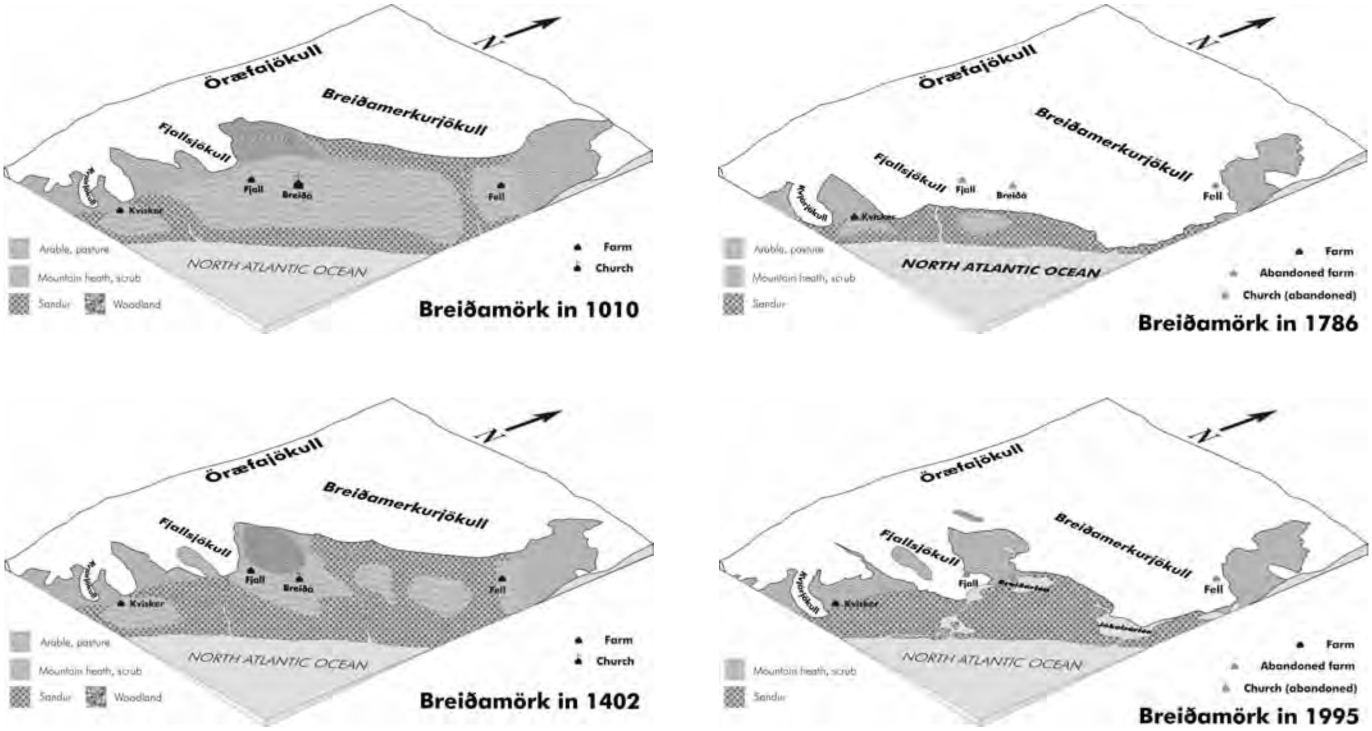

Figure 10. Oblique views (block models) showing historic changes in Breiðamörk, southern Iceland.

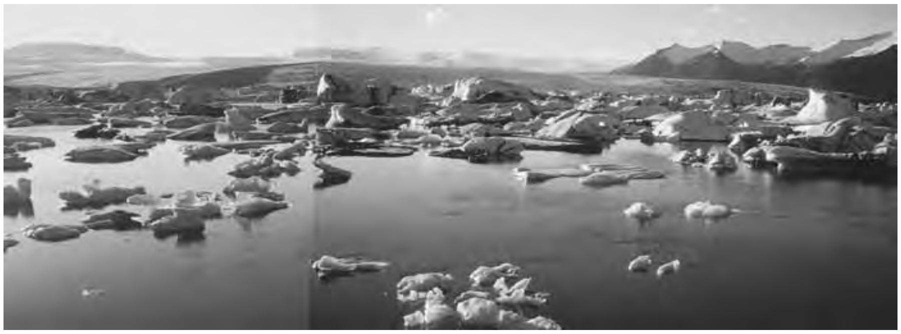

Figure 11. Jökulsárlon, proglacial lake at southeastern edge of Breiðamerkursandur. This lake extends approximately 100 m (300 ft.) below sea level and was excavated by advancing glaciers during the Little Ice Age. Photomosaic facing generally northwest.

ice cores" (Björnsson, 1980, p. 209). However, some of the mountain glaciers in northern Iceland apparently did not advance as far, perhaps in response to reduced precipitation with the growth of sea ice (Stötter et al., 1999).

The Little Ice Age Ends

Perhaps partly due to the positive feedback mechanisms of the glaciers or Iceland's location on the edge of the Arctic, the Little Ice Age ended later in Iceland than in central Europe (Grove, 1988). As it began with the irregular advance of glaciers with different lag times, so it ended in an irregular fashion. Farms overrun by Drangajökull and Breiðamerkurjökull during the Little Ice Age are now mostly melted free, and the Gláma and Ok ice caps have disappeared. Recession began in the 1890s, became rapid after 1930, slowed in the 1960s, and has varied since (Björnsson, 1980). Based on the recession of Breiðamerkurjökull (Figures 10 and 11), Sigbjarnarsson estimated the shrinkage of Vatnajökull since its Little Ice Age maximum at somewhere between 268 and 350 km^3 (8 to 10 percent of its total mass), which, if continued at this pace, would result in the complete disappearance of Vatnajökull in 600 years. "Whether melting at a similar rate over a period as long as six centuries would ever be likely to occur is, of course, quite another matter"(Grove, 1988, pp. 55–56).

Analysis and Summary

More than colder temperature is needed to cause glaciers to grow. As pointed out by Stötter et al. (1999), precipitation must keep pace with or outpace the drop in temperature. If sea surface temperature does not drop as much as land surface temperature, significant moisture may encounter a lower equilibrium line altitude (ELA), and the growth of ice will provide a positive local feedback encouraging the precipitation to fall as snow. Lower summer temperature and increased cloudiness help to maintain a lower ELA and reduced summer melting, which will result in a positive mass balance. As shown in Figure 12, an even lower ELA than what occurred in the Little Ice Age must have existed thousands of years ago for Vatnajökull to have formed in the first place; only the ice itself holds the surface of Vatnajökull above the ELA today.

Historic evidence points to a climate at *Landnám* in Iceland as warm as now or slightly warmer than at present, with cooling beginning about AD 1200. The drop in temperature was apparently accompanied by a less significant drop in precipitation (or possibly no drop in precipitation), resulting in a lower ELA. Inferred drops in ELA and temperature for Iceland are shown in Table V. These equate to a roughly 2°C lower Little Ice Age temperature relative to today, and approximately 3 to 4°C relative to the inferred temperature of *clima optima* (Björnsson, 1980). Based on the historical evidence presented above, the drop in temperature and ELA from the pre-*Landnám* optimum to the Little Ice Age

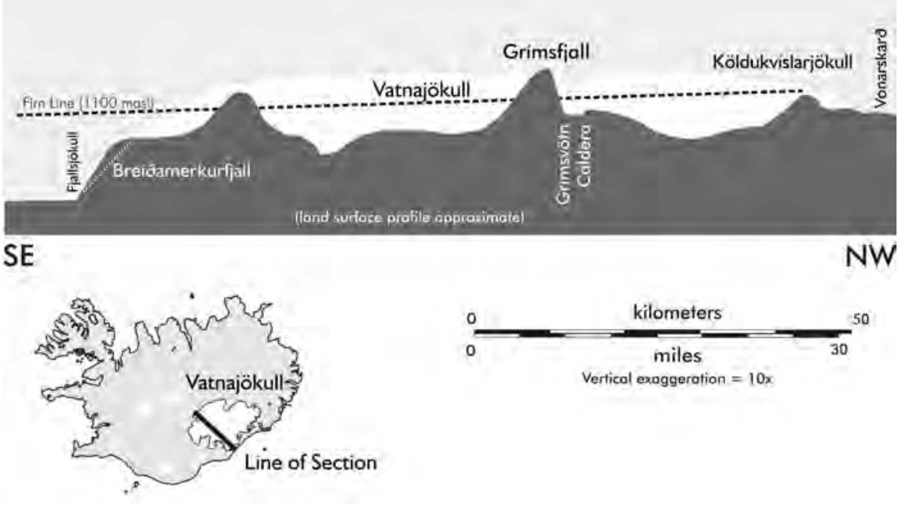

Figure 12. Section through Vatnajökull

	Little Ice Age Inferences			References	
Glacier/Region	Year	Temperature Difference	E.L.A. Difference	Base Year(s)	Author
Sólheimahjájökull	ca. 1800	-1.6 °C		1960–90	McKinzey et al., 2005
Eiríksjökull	ca. 1875	-1.5 °C	-250 m	ca. 1990's	Guðmundsson, 1998
Tröllaskagi	pre-1925		-200 m?	post 1925	Caseldine, 1987; Björnsson, 1980
Tröllaskagi-Hörgárdalur	1800's		-5 m		Häberle, 1991
Tröllaskagi—observed		-2 °C	-50 m	1925–1960	Caseldine & Stötter, 1993
Tröllaskagi—theoretical			-300 m		
Iceland in general	1600–1920	-3 to -4 °C	ca. 200 m/° C	*clima optima*	Björnsson, 1980

Table V. Inferred Little Ice Age equilibrium line altitudes

maximum was probably about 2°C, or slightly more, and 500 m, respectively.

The rise in average temperature and resulting rise of the ELA during the twentieth century to approximately their *Landnám* values did not occur in isolation from the rest of the North Atlantic region or the rest of the world climatically. As will be shown, these changes were contemporary with similar climatic and glacial developments in Norway and Greenland and coincided with "climatic improvement" elsewhere in the world (Grove, 1988). While, as indicated in Figures 2 and 10, present conditions are not as favorable to human occupation as they were a thousand years ago, conditions on Breiðamerkursandur are now improved to the point of inciting legal action by the descendants of those who owned the ravaged farms, land now claimed by the government (Hornafjörður, 2004). Retreat of the ice has also exposed a wide variety of landforms and sedimentary deposits, which will be the focus of the concluding paper in this series. Iceland has become a focal point in the global climate change debate, and for those who hold to the biblical worldview, it has become a laboratory for evaluation of climate models and ideas for the postdiluvian period. Climate change and the Great Ice Age will also be addressed in future parts of this series.

Acknowledgments

Invaluable assistance was provided by Síndri Guðjónson, Guðni Jónsson, Maria Wilhalmsdóttir, Kathryn Dion, and other helpful Icelanders, especially those at the University of Iceland, Sólheimahjáleiga, and Brunnhóll. While not all may agree with our conclusions, we hope they will consider what we have presented in this paper. We thank David Sunwall and Arve Misund for help in acquiring scientific papers and graphics files. We also thank Al Gore and the Nobel Peace Prize committee for generating widespread interest in our research. This research was made possible by assistance from the Creation Research Society and Mr. & Mrs. Henry Klevberg. *Deum laudamus* (Psalm 144:5).

Glossary

Dicuil—an Irish monk who recorded the discovery of Iceland by Irish monks in the 800s.

diluvialist—one who maintains that the Deluge of Noah's day was the principal global geologic event in earth history since the Creation.

jökullhlaup—a glacial outburst flood; these typically occur in Iceland as a result of subglacial volcanism, but they can also be triggered by buoyancy effects, with periodic release of water as whenever the ice dam floats. Jökullhlaups suddenly release the stored water in great floods that carry ice and sediment to the sea.

Landnám—Old Norse for settlement of a previously uninhabited land.

postdiluvian—the period of earth history after the Deluge (Genesis Flood), probably consisting of a time of residual catastrophism and a great ice age followed by a more stable period of relative climatic equilibrium.

proxy—a phenomenon that is mathematically or causally related to the phenomenon of interest, e.g., length of growing season can be a proxy for average annual temperature.

tún—farm yard, area between the buildings of a farm.

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Stötter, J., M. Wastl, C. Caseldine, and T.

Letter	Pronunciation	Letter	Pronunciation
“Short” Vowels (typically before double consonants)		“Long” Vowels (typically before single consonants)	
a	a as in *arm*	a	*a* as in *father*
e	*e* in *red*	e	*e* as in *very*
i	*i* as in *into*	i	*i* as in *believe*
o	*o* as in *not*	o	*o* as in *long*
u	a little softer than *u* in *useless*	u	like *u* in *futile*
y	like second *i* in *intrigue*	y	like *y* in *really*
æ	like *i* in *hi* (or *æ* in Latin)	æ	like *i* in *ivy* (or *æ* in Latin)
u	like *u* in *under*	u	a little more like *u* in *urgent*
Accented Vowels		Consonants and Diphthongs	
á	like *ou* in *ouch*	Þ,þ	like *th* in *thing*
é	like *ye* in *yen*	Ð,ð	like *th* in *there*
í	like *e* in *reed*	ei	like *ey* in *hey*
.ó	like *ou* in *soul*	au	slightly longer than *y* in *Færöy*
ú	closed" or "hard" *u*, like *deux*	c, q, w	foreign words only
ý	closed" *y* like Swedish	z	like *z* in *zebra*, but seldom used

Table VI. Guide to Icelandic Pronunciation

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Appendix A: Pronunciation of Icelandic Names

Icelandic is a relatively phonetic language, but many of the letters are likely to be unfamiliar to many English-speaking readers. This brief guide should assist most readers in coming close enough to actual pronunciation to make name recognition possible. Icelandic contains a larger alphabet than English, and the additional letters are included in Table VI.

Appendix B: Veracity of Saga Historiography

Much of our knowledge of Iceland from the end of the previous millennium is necessarily derived from the *sagas*, typically prose compositions of considerable length describing the lives and actions of notable people. Sagas were transmitted orally; many were apparently not written down until two or three centuries later (Sturlasson, 2008; Pálsson, 2000). Associated with sagas were *þáttur* (a shorter literary form) and poetry of various forms known as *kvad*. As in Anglo-American poetry, rhyme and meter are important in a *kvad*, along with alliteration and assonance. As a more highly developed (inflected, intricate, and specific) language than English, however, Old Norse was less syntactical, permitting great freedom in word order. Great weight was placed on the use of metaphor. The resulting poetry was very “tight” and did not lend itself to change. Once a *kvad* was in the public domain, it was not easily corrupted. It might have been lost, in whole or in part, and the metaphors might have ceased from common usage, but it was not likely to be changed.

The saga literary form is one of almost minimalist action. Description is scarce and typically tied to the appearance of major personages, not landscapes or climate. This has the obvious disadvantage to this study of providing scant data. It has the less obvious advantage that the saga authors had no motivation to fictionalize any of the descriptions that do appear. There is a wide variation in the types of sagas–some are obviously tall tales (usually mythology or romanticized religious writings) meant to entertain, while others are very different, especially the *islendingesagaer*, which appear as sober history. It is not difficult to tell the difference.

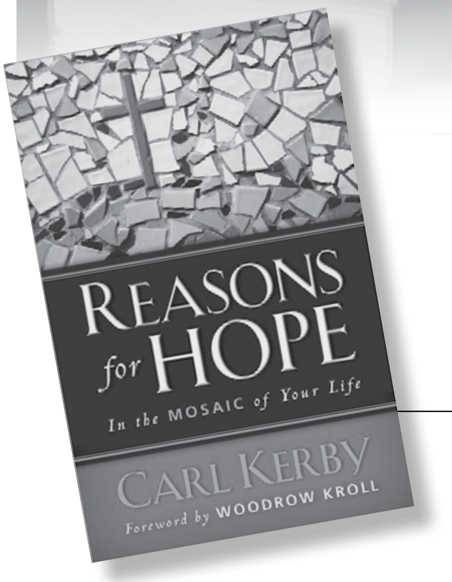
There are two major schools of thought regarding the veracity of *islendingesagaer* (Pálsson, 2000). *Friproseteorien* is the position that these sagas are as they appear: historical accounts. The events they contain are, by and large, historical events honestly reported. The veracity of individual sagas may vary, of course, just as one should not put as much weight on the writings of Michael B. Shermer, Washington Irving, or Sheila Rowbotham as on the writings of Herodotus, James Ussher, or Alexis de Tocqueville. *Bokproseteorien* is the position the sagas contain very little historical truth and should be seen not as a source of historical data, but as great works of literature, of *belles letres*.

We favor *friproseteorien*. Those who recognize the infallibility of the Bible and the wealth of data substantiating its veracity will hear a familiar ring in the lines of *bokproseteorien*. Just what creative greatness lies in such mysterious opening lines as "Gunnlaug was the name of a man," is a little difficult for some of us to grasp. Archaeology and geography have confirmed the historicity of many places mentioned in the sagas.

This is not to deny the need for careful historical research and judgment. For example, there is much overlap between *Eiríks soga rauðe* (Erik the Red's Saga) and *Grönlendingene soga* (Saga of the Greenlanders), but the former contains embellishments and anachronisms, while the latter does not. Nonetheless, *bokproseteorien* held sway with *Grönlendingene soga* until the Ingstads vindicated it by following its account from archaeological site to archaeological site clear to the Vinland settlement in Newfoundland (Ingstad and Ingstad, 1996). Even *Eiríks soga rauðe* is superior to Shermer or Rowbotham, however, and many historic elements may be gleaned from it.

Sagas from which we have obtained information for this paper are indicated on Figure 6. Also indicated are sites cited from *Landnámabok*, a largely genealogical work documenting the settlement of Iceland that dates from at least the late 1200s (i.e. the manuscript used for Kjørsvik Schei's translation) but clearly draws on sources one to two centuries older (Landnåmsboken, 1997).

Media Reviews



Reasons for Hope

by Carl Kerby

Genesis Publishing Group,
Bartlesville, OK, 2011,
240 pages $15.00.

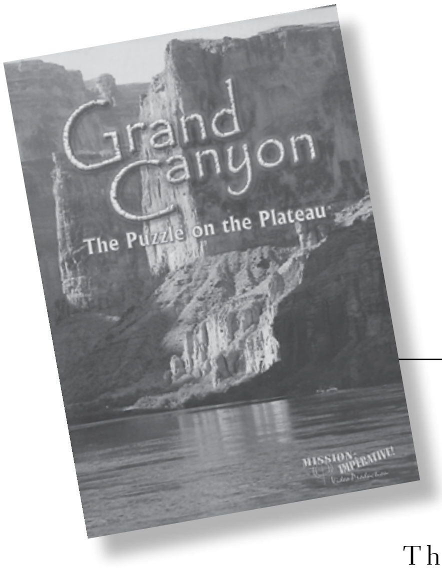
Author Carl Kerby tells a fascinating story of his life journey. Some of the negative details include a distant professional-wrestler father, child abuse from a relative, a broken home, dropping out of high school, and a wild lifestyle as a youth. This tough start in life is then transformed by God's grace. There follows military discipline, training in air traffic control, conversion to Christian faith, a wonderful wife Masami, and exposure to the excitement of biblical creation. Following a period of behind-the-scenes service to Answers in Genesis, Carl became an AIG board member, then one of their most in-demand speakers. In 2011 Carl moved on from AIG and launched a new speaking/writing ministry called Reasons for Hope (rforh.com).

This book expresses Carl's well-known enthusiasm for sharing the gospel. Along the way he provides insights into the world of professional wrestling and also air traffic control. One theme concerns *mosaics*, a name sometimes given to the current generation of multitasking, experience-seeking youth. In Carl's case, a mosaic represents his background experiences that give personal insights and understanding for those in desperate need of direction, stability, and salvation.

The book includes concise answers to some of the popular Bible-science questions: Why does God allow suffering? Where do dinosaurs fit in biblical history? How could all the animals fit on Noah's ark? What is the origin of people groups?

This is an encouraging book to read. The Bible-science speaking circuit is not an easy schedule but is much needed. Carl Kerby deserves admiration and support in his ambitious efforts.

Don DeYoung
DBDeYoung@Grace.edu



Grand Canyon: The Puzzle on the Plateau

DVD. Mike Snavely.

Mission: Imperative! Video Production, 2010, 53 minutes, $20.00.

This fascinating DVD hosted by Mike Snavely is an amazing graphical tour of the Grand Canyon and its geological history. Snavely, president of *Mission: Imperative!* presents evidence for the rapid formation and recent origin of the canyon and gives a compelling presentation of the dam-breach hypothesis for its formation. Featuring excellent photography and video of the canyon and surrounding landmarks such as Petrified Forest National Park (NP), Arches NP, and Canyonlands NP, this video documentary takes viewers on a journey to the true nature of these natural wonders. While there are many technical ideas and terms in the film, all are explained clearly, and computer animation and graphics allow the viewers to get a visual grasp of concepts that might otherwise be hard to understand and appreciate. The film sports spectacular footage of the Grand Canyon and other national parks, as well as excellent production, graphics, and sound.

In addition to the main production, there is a bonus video featuring Snavely and others rafting down the Colorado River. This humorous video journal features more great photography and is especially recommended for those considering such a trip.

I highly recommend this DVD to all interested in learning more about the Grand Canyon and its formation. A side note is worth mentioning here: Not all scientists agree about the way the canyon formed. This production discusses different views but makes the case for the dam-breach hypothesis. This is the nature of good science, and even those who might not agree with the conclusion of the film can benefit from the visual tour of the area and the first-class presentation of the theory. Overall, the film is outstanding. All can enjoy and benefit from this educational production.

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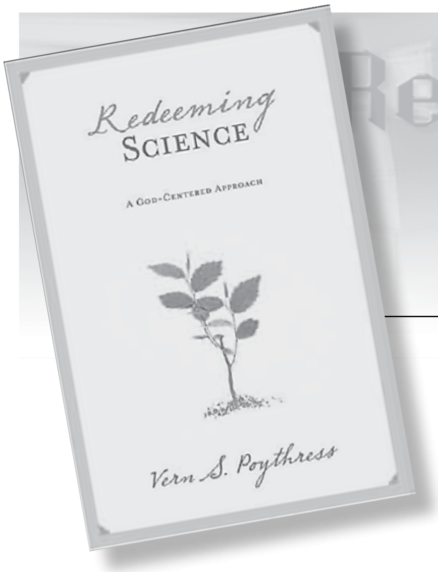

Redeeming Science

by Vern Poythress

Crossway Books, Wheaton, IL,
2006, 381 pages, $20.00.

Vern Poythress, professor of New Testament interpretation at Westminster Theological Seminary in Glenside, Pennsylvania, authored *Redeeming Science, A God-Centered Approach*, in 2006. Recently, a copy was sent to all the alumni of the seminary, of which I am one.

It is a long book of 381 pages, including appendices, bibliography, and index. In it Poythress gives a detailed theological and scientific interpretation of Genesis 1, titled "Creation, Science, and Intelligent Design." His academic background is evident in the handling of the material. Along with a Th.D. in New Testament from the University of Stellenbosch (South Africa), Dr. Poythress also holds a Ph.D. in Mathematics from Harvard University.

The book is very readable and persuasive. Toward the end it even has a discussion of quantum equations and the wave operator. However, its erudition is marred by some very questionable assumptions of biblical interpretation, which strongly color the thought of Poythress and many other seminary professors of our time. For example, on page 121, Poythress asks,

> What do we say about animal death? The later scriptural statements are talking about human death. God created man to have fellowship with him and to enjoy life in the presence of God forever. ... The animals and plants, however, did not enjoy the same exalted status as man. In fact, later on God explicitly gives to man the authority to kill animals for food, but not to kill a fellow human being (Gen. 9:3, 6). ... Psalm 104, a psalm that repeatedly alludes to the creation in Genesis 1, includes details that imply animal death … These all [all sea creatures, and probably all land creatures as well] look to you, to give them their food in due season (Ps. 104:27). Food here must include large fish eating small fish; this verse describes God's continuing providential control over the present order, not a vegetarian past]. (*Brackets are in the original.)*

"I conclude that we do not have any firm basis for saying that animal death started only after the fall of man" (p. 122). This is the author's conclusion, despite the fact that just a couple of pages earlier, he notes that, "The presence of death seems in disharmony with the pronouncement that the creation was 'very good' (Gen. 1:31), and with the later scriptural statements that death came through one man, Adam (Rom. 5:12; 1 Cor. 15:12; Gen. 3:19).

Poythress goes on to immunize himself from criticism on this topic with this statement on page 122: "Again, we must beware of presuming to dictate to God what kind of world he had to create. It had to be 'very good' in his sight; but that is not the same as saying that it must match what some of *us* may think ideal."

In his outwardly balanced approach, it is interesting that Poythress notices the clear meaning of these words from the Fourth Commandment: "For in six days the Lord made heaven and earth, the sea, and all that is in them, and rested on the seventh day" (Exod. 20:11). He uses this verse to strike down the day-age theory for Creation (p. 112), and also the analogical-day theory (p. 131ff). However, he chooses to overlook the theological implications of this verse in his discussion of animal death above.

Yet again, Poythress is noncommittal in his theological discussion of Noah's Flood (p.129): "I conclude therefore that Genesis 6-9 by itself does not clearly indicate exactly how extensive the flood was. It covered an extensive area—the ordinary 'world' of the ordinary person in the ancient Near East. Possibly it covered the entire globe, but Genesis does not turn this possibility into a certainty. Consequently, we must go out and look at other parts of the world, alert to what further information may appear there."

One would think from this last sentence that Poythress would go on to the scientific work of young-earth creationists who indeed are actively "going out and looking at other parts of the world." However, in his bibliography of over 200 sources, Poythress includes only the pioneering book *The Genesis Flood* (1961) by John Whitcomb and Henry Morris, *The Young Earth* (1994) by John Morris, and *Starlight and Time* (1994) by Russell Humphreys (which Poythress dismisses as having a flaw in its physical reasoning). Unfortunately, these are the only young-earth creationist works listed. In fairness, there are a dozen or so books listed from the intelligent design movement, including those of William Dembski, Phillip Johnson, and Michael Behe.

Relatively speaking, Vern Poythress is one of the most conservative scholars today teaching biblical interpretation at seminaries that offer graduate theological degrees. However, it is troublesome that this brand of nuanced interpretation is raising up yet another generation of pastors and teachers, without providing them the solid biblical foundation with which they could help believers to strengthen their faith in the Creator God, and thus truly "redeem science."

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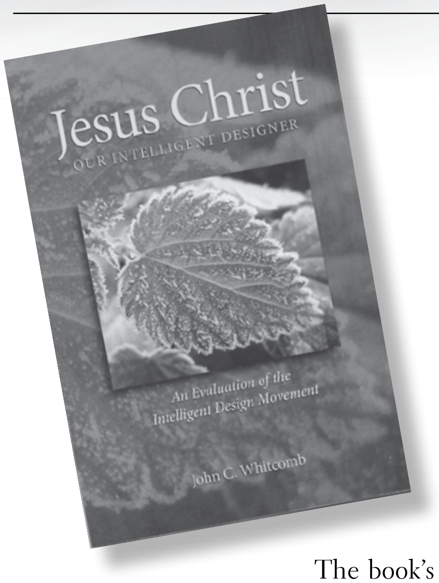
Jesus Christ: Our Intelligent Designer

by John C. Whitcomb

Kainos Books, Waxhaw, NC, 2011, 110 pages, $10.50.



The book's subtitle is *An Evaluation of the Intelligent Design Movement*. ID summaries are brought together from William Dembski (14 pages), Henry Morris (33 pages), Georgia Purdom (7 pages), Carl Wieland (14 pages), and author John Whitcomb himself (32 pages). Two forewords are written by John Morris and Ken Ham.

Intelligent Design is stated to be essential to biblical Christianity but not sufficient (p. 41). This is illustrated by the Apostle Paul's strategy in speaking with the Greeks of his day. They were fully aware of abundant design in nature, just as people are today. And similar to our own day, the Greeks simply were not impressed with the theological implications of design. Therefore, Paul went to the heart of the problem and preached Christ to all who would listen (p. 40).

A key problem of the ID movement is that many proponents intentionally leave out any explicit reference to the Designer. Also omitted is biblical data concerning the age of the earth, the Curse or Fall of mankind, the global Genesis Flood catastrophe, and the modern science trend toward naturalism. This lack of a historical context for intelligent design opens the door widely to questions, doubt, and possible cultic interpretation. Henry Morris writes, "As faith without works is dead, so is design without the Designer…The reason [Intelligent Design] won't work is because it is *not the biblical method*" (pp. 50–51).

John Whitcomb does not share the optimism expressed in Phillip Johnson's 1997 book titled *Defeating Darwinism*. If people are to enter the kingdom, it must be brought about "by the Holy Spirit in answer to prayer" (p. 48). In past years I had the privilege of taking all of Dr. Whitcomb's courses at Grace Seminary, Winona Lake, Indiana. One truth learned is that intelligent design is rational and irrefutable, with no excuse for its rejection (Rom. 1:20). At the same time, however, fallen people are entirely irrational in their rejection of truth and their adoption of lies and satanic counterfeits. An inner confrontation is needed with the gospel; that is, God's clear message to us through His Word.

The main value of intelligent design may be as an open door for personal conversation in presenting the Designer. This inexpensive book is a useful summary of ID strengths and limitations.

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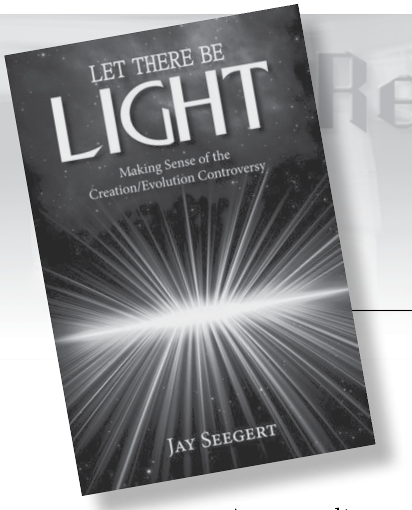

Let There Be Light

by Jay Seegert

Xulonpress.com, 2010,
285 pages, $17.00.

Amazon lists more than ten books with this popular title. However, author Jay Seegert's book is distinctly creationist and well done. The subtitle is *Making Sense of the Creation Evolution Controversy*. The writing style is nonconfrontational and gracious, yet very clear in presenting the creation worldview. Jay Seegert provides a wide-ranging overview of creationist astronomy, Flood geology, and biology.

The reader will find a wealth of less-familiar quotes, each fully documented. There are also up-to-date discussions of the Tiktaalik fossil (p. 74), the RATE project (p. 184), and biblical archaeology (p. 138). Classic creation-evolution arguments are also covered, including vestigial organs, the peppered moth, fossil horse series, blind cave fish, and homology (p. 106).

The incredible design found in nature, even in its current imperfect state, is described as the "elephant in the living room" for evolution theory (p. 207). There is a hilarious description of the proposed evolutionary development of sexual reproduction (p. 112). The book includes many helpful black-and-white figures but no index.

Author Jay Seegert holds undergraduate degrees in physics and engineering. For 25 years he has conducted seminars on creation and biblical teaching. An active member of the Creation Science Society of Milwaukee (cssmwi.org), Jay served as president of the group for three years. In 2008, Jay transitioned from his computer programming business to a full-time speaking ministry, founding the Creation Education Center (CECwisc.com). He is also an adjunct speaker for Creation Ministries International. In addition to this book, Jay has produced a number of DVDs, which are available through his website.

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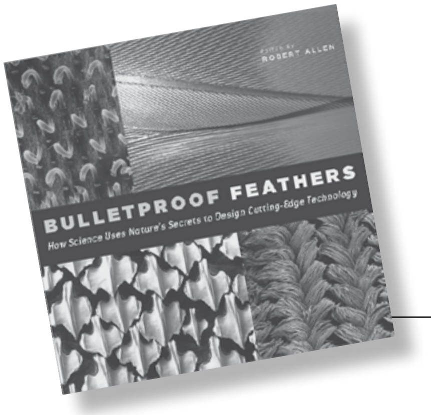
EDITED BY
ROBERT ALLEN
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How Science Uses Nature's Secrets to Design Cutting-Edge Technology

Bulletproof Feathers:

How Science Uses Nature's Secrets to Design Cutting-Edge Technology

edited by Robert Allen

University of Chicago Press,
Chicago, 2010, 192 pages,
$35.00.

This book discusses the popular topic of biomimicry, the use of inspiration from nature for the solution of technical problems and the development of new products. Editor Allen is a biodynamics professor in England and also founder of the journal *Bioinspiration and Biomimetics: Learning from* Nature. Six writers contribute to this book, each one active in the field.

The topic of biomimicry is of growing interest. Engineers and inventors increasingly look to nature for new ideas. Unfortunately and unnecessarily, credit for "apparent design" in nature is often attributed to long ages of slow change: "Over billions of years of evolution, nature has been making trial-and-error experiments within the laws of physics, chemistry, materials science, and engineering" (p. 46). I counted this type of language twelve distinct times in the first few pages of the book. This secular explanation for design fails on several counts. For example, gradual, progressive improvements are lacking in the fossil record. To the contrary, some of the most advanced designs are found in fossil remains. Furthermore, many of the most advanced designs in nature are inorganic, or nonliving. Such devices do not mutate or naturally select over time. The design features encompass fields including nanotechnology, optics, mechanics, and materials science. For a creationist interpretation of over one hundred examples of biomimicry, see *Discovery of Design* (DeYoung and Hobbs, 2009) and the website DiscoveryofDesign.com.

Some well-known architectural biomimicry examples are challenged in the book. It is stated that Gustave Eiffel did not model the Eiffel Tower on the human femur, and London's Crystal Palace was not influenced by studies of the water lily (p.165). The writer gives no references, and literature research shows otherwise in both cases. Planned, intelligent design in nature has had a major influence on architecture worldwide.

The book reviewed here is beautifully illustrated with glossy color images. The discussed designs are somewhat specialized, with twenty pages given to underwater acoustics (pp. 66–86) and also twenty pages on human robots (pp. 44–65). Editor Allen concludes that applying efficiency as found in nature is mankind's hope for survival. Certainly we have much to learn from the endless practical designs embedded all around us in nature. These fascinating designs, however, have been present from the beginning of time, and they display the clear fingerprints of the Creator. For ultimate, eternal survival, one needs to look beyond nature's secrets to the One who provided these gifts in the first place.

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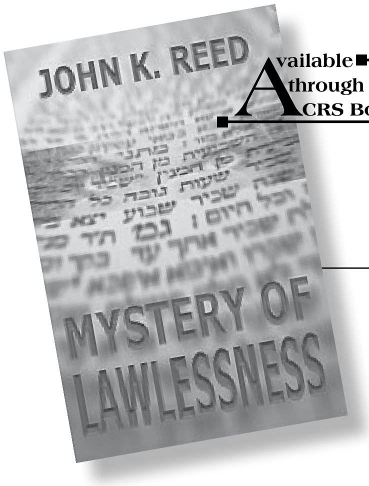
Reference

DeYoung, Donald, and Derrik Hobbs. 2009. *Discovery of Design*. Master Books, Green Forest, AR.



Available through the CRS Bookstore

The Mystery of Lawlessness

by John Reed

Reasonable Hope Ministry,
Summerton, SC, 2010,
450 pages, $12.00.

The last book in John Reed's *Lost Worlds* trilogy is as thought provoking and brilliant as his first two books. Dr. Reed explores the motivations of those who rebelled against the Almighty and of Noah and his faithful descendants. Lust, greed, and especially the overwhelming desire for power propel Nimrod and those who follow him toward their own undoing. It is an amazing and well-written story that reveals the temptations that are common to man and the depths to which we can fall. In contrast it shows the forgiveness and wisdom that is available to all of us as we seek to obey the Lord.

Several narratives intertwine to form the book. Madrazi, wife of Seth, Noah's son, dies and gives her memoirs to Lydia to deliver to Abraham. Lud, Shem's servant, is sent as her bodyguard. The book details the challenges and suffering involved in fulfilling Madrazi's last request. The book switches between Lydia's story and the rise of Nimrod. A third theme woven through the book is a group from Shem's family attempting to find passage through the rugged mountains to a new home far from those who desire their destruction.

The machinations of Nimrod and his grandmother lead Nimrod to seduce Noah's oldest daughter Mariel. Her foolishness and the shame she brings to her family quickly become apparent to her. Alone in a palace in Babel, she finds Ham, Nimrod's grandfather, in a workshop. He becomes an unexpected comfort. Ham's wife, Debseda, remains enamored with the evil in the old world. She rejects Ham as weak and teaches rebellion to her sons and grandsons. Her hatred for God and her desire for power lead her to choose the strongest grandson and to seduce him and become the power behind him. All seems lost. Mariel can find no way home and is surrounded by danger. Lydia is captured, and plans to attack Noah's family are in the works. Shem's family is lost in the mountains. But through all of the pain, God gently teaches and redeems those who are willing. The book shows how God has a plan in spite of man's trials, rebellion, and sin.

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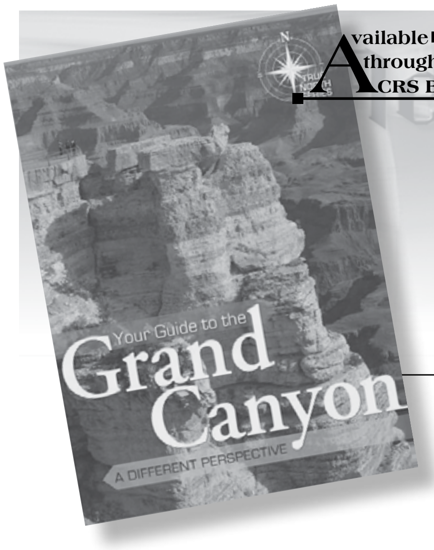

Available through the CRS Bookstore

The True North Series: Your Guide to the Grand Canyon

by Tom Vail, Michael Oard, Dennis Bokovoy, and John Hergenrather

MasterBooks, Green Forest, AR, 2008, 190 pages, $15.00.

Recently I visited the Grand Canyon for the first time. I love geology and wanted to get the most out of the visit to this natural wonder. However, I wanted to familiarize myself with the canyon as much as possible before going in order to make the most of the trip. This spiral-bound book was definitely the best guide to the Grand Canyon that I found. It covers geology, environment, and history, as well as general information on enjoying the visit and making one's way around the park. Featuring stunning photography, it includes 26 foldout pages that give the viewpoint from each of the major overlooks to be found throughout the park, including both the North and South Rims.

The book is divided into ten major sections, each covering a specific aspect of the canyon. Section One explains how to use the guide. Section Two gives readers a brief survey of the two major perspectives on the origin and age of the canyon. Section Three details various ways to see the canyon and gives general information on getting the most out of a trip. Section Four returns to the idea of two competing worldviews to explain the canyon and its formation, giving some key features to watch for while visiting. This section is especially helpful for understanding the information found at the numerous interpretative signs and displays in the national park from a young-earth perspective. Section Five is the core of the guide, featuring beautiful, foldout color pages that feature each lookout and point out the specific geological features to be seen, along with interesting facts about the canyon's history. Section Six discusses the importance of viewing the canyon through biblical glasses. Seven is a more in-depth discussion of the geology to be found, especially below the rim, while Eight provides a guide to the fossils to be found. Section Nine is a guide to the ecology of the area, and Ten reviews the history of the discovery and development of the canyon as a major tourist attraction and national park, as well as World Heritage site. The book also includes a glossary, list of further references, and a complete index.

There are a few small typos that can be corrected in a future edition. On page 38, Section Five, first paragraph, "section" should be changed to "sections." On page 39, the first bullet point should say "The main Visitor Center *and* Grand Canyon Village…" rather than "to the and." On the same page at the bottom, the Scripture reference should read, "Hold fast to *that* which is good."

Overall, the book is very well written and a treasure for hikers, nature lovers, and anyone else visiting the canyon for the first or fiftieth time. I highly recommend it for use before, during, and after your trip.

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Conference Reports

CRS Conference Abstracts

July 22–23, 2011 • Trinity Baptist College • Jacksonville, FL

On July 22–23, 2011, the Creation Research Society held a conference at the Trinity Baptist College (Jacksonville, FL). Below are abstracts of presentations given during this two-day conference. Voting members of CRS were allowed to author or coauthor abstracts, and sponsor submitted abstracts from non-voting members. The purpose of this conference was to provide a forum for the free discussion of a wide variety of cutting-edge ideas pertaining to the creation model of origins.

Coordinating Committee:
Danny Faulkner, Ron Samec, and Kevin Anderson

Plenary Presentations:

Jesus Is Like My Scanning Electron Microscope

Mark H. Armitage

The process of preparing biological tissues for electron microscopy is intensive and laborious, but the tissues must be changed in order to withstand the otherworldly position of the vacuum chamber and the electron beam. In a similar fashion, when we are prepared to be ushered into the otherworldly position of fellowship with Jesus Christ, the Creator of the universe, changes occur. In this talk, a scientist looks at his relationship with the Creator.

The Language of DNA: A Creationist Perspective

Kevin Anderson

The results of sequencing the human genome have provided geneticists a treasure-trove of insight into the genetic workings of the cell. New discoveries have challenged many long-held evolutionary assumptions, including the 1% DNA similarity of humans and chimpanzees and mutations as a genetic mechanism for common descent. New discoveries have also presented serious challenges to any naturalist explanation of the intricate detail and sophistication of the human genome's structure and organization. A creation model provides a far richer and more robust understanding of the human genome and is fully consistent with biblical teachings of creation.

Submitted Presentation Abstracts:

Footprints of the Flood: Transverse Drainages of the Susquehanna River Basin and Beyond

Jacqueline S. Lee

When a stream incises through a highland in apparent disregard for the laws of physics, the resulting erosional feature is called a *transverse drainage*. Transverse drainages are problematic for conventional geologists because there is no completely satisfactory explanation for why streams should flow directly through topographic highs. While large-scale transverse drainages such as those of the Susquehanna River above Harrisburg, PA, have been recognized since the nineteenth century, newly available geoimaging tools have revealed that the frequency and distribution of transverse drainages are far greater than had been previously supposed. Here, the results are presented of a detailed topographic and statistical analysis of the Susquehanna River basin, using freely available geoimaging applications. Over 600 transverse drainages were discovered in the study area, the majority of which are located on streams with discharges of less than 10 cubic meters per second. A survey of the rest of the Eastern Continental Divide reveals hundreds of other transverse drainages, from Connecticut to Alabama, with the majority being located within the Chesapeake and Ohio watersheds. A brief survey of the Colorado River watershed and other areas of the world shows that transverse drainages are ubiquitous worldwide. Analysis of these transverse drainages may help explain the origin of many features, including the northward flow direction of the New River, the distribution of fossil bone beds, and the origin of the Grand Canyon. The frequency and distribution of transverse drainages around the world are most easily explained as catastrophic channelization on a global scale as landscapes emerged from inundation.

Toward a Reconstruction of Adam and Eve

Robert W. Carter

Modern genetics is producing a flood of new data, including diversity data from multiple individuals in multiple world populations. Since DNA is inherited from one generation to the next, the study of genetics is essentially a study of time. Thus, this new information allows us to test theories of history. The Bible makes strong historical statements. Specifically, it claims that all modern people are descended from a single pair of individuals, Adam and Eve. If this is true, the modern human population, separated from Adam and Eve by 6,000 years and 150-200 generations, should show signs of their origin. However, it will be necessary to estimate the effects of 6,000 years of mutation, recombination, drift, and selection before we can draw conclusions from the available data. This will be a report on what we know, what we may discover in the future, and what cannot be known due to the effects of time on the genome. From most appearances, the current state of the human genome worldwide generally fits into the young-earth scenario, though puzzles remain.

Type 1a Supernovae and Time Dilation

Mary Beth de Repentigny

There seems to be some disagreement among creation scientists as to what the type 1a supernova data are telling us about time dilation. Therefore, an exploration of these data and how they fit in with creationist cosmologies will be appropriate, the goal being to help bring greater unity among us as we seek to understand the glory of God revealed in His created heavens.

Astrochronology I: Where is the Intracluster Medium (ICM) in Globular Clusters?

Ronald G. Samec

Globular clusters (GC) are spherically shaped, rich clusters of stars that orbit their galaxies at random inclinations and eccentricities, much like comets in orbit about the solar system. They are Population II objects, so they are clear of intracluster medium (ICM), that is, dust and gas. However, their component stars, as they age, blow off stellar winds of gas and dust. Therefore, GC's, as well as their "twins," the dwarf spheroidal galaxies that orbit as companions to their parent galaxies, should accumulate dust and gas steadily from these winds. So, where is the ICM? We will explore this problem in depth and discover their astrochronology age (1 million to 100 million years) is similar to the creation cosmological age (for time dilation cosmologies) predicted for Humphreys's wind-up time for spiral galaxies (a few hundred million years) but much less than the 13.7 gigayears age given by cosmologists.

Science and Scripture Support "Programmed Filling," Not "Natural Selection"

Randy Guliuzza

This lecture will discuss some of the liberating truths of "Programmed Filling": a biblically consistent and scientifically superior paradigm that explains exactly what is happening at the organism-environment interface that will replace the failed notion of natural selection. Main points will include: what natural selection is expected to do for evolution theory; why the whole concept of natural selection perverts a proper understanding of an organism's God-given innate capabilities to adapt; why it falsely empowers environments and thus is vital for initiating and allowing Darwin's false hope of evolutionary change to persist. Major creationist organizations say different things regarding natural selection. For ICR, there will be three very visible points of departure between our old and new approaches to natural selection that amount to far more than a change in jargon: (1) natural selection is not real; (2) usage by ICR that acknowledges it in any way greatly dishonors the Lord; (3) programmed filling – a God-ordained mechanism that honors Him – is reality.

The talk will explain why, for ICR, they now believe their historical criticisms of natural selection consistently "answer a fool according to his folly" by starting within the confines of natural selection's false reality. By recognizing the explanatory power of programmed filling, believers will actually have a communicable and scientifically accurate pushback to natural selection that is just as enlightening and easy to understand.

The Origin of Water: How Is This Explained?

Lawson L. Schroeder

Water is one of the most common substances on earth. The correct explanation for water's origin is essential for understanding God's Creation. The Bible's explanation for the origin of water is significantly different from theories that believe the universe and life appeared by chance.

Data were obtained from the Bible and scientific literature available in books, journals, and the Internet. This information is analyzed and compared for accuracy, validity, and compatibility to the biblical account of creation.

Two popular, secular explanations for the origin of water on earth and in the solar system are presented. The first maintains that over a long period of time Earth's water came from comets, meteors, and other ice-bearing objects that collided with the Earth. The second maintains that hydrogen and oxygen atoms needed for most, if not all, of Earth's water were embedded in rocks that formed the Earth. A compromise position has surfaced that proposes that Earth's water may have come from both sources.

The biblical explanation for water's existence is given with multiple references.

Mankind's theories for the origin of water assume that hydrogen and oxygen atoms in space or found in rocks accidentally combined to produce incredibly huge amounts of water for both Earth and the solar system. However, the Bible makes many clear statements that God created water from the beginning for His purposes in creation. The Bible's explanation of the origin of water is correct. All of the others just don't hold water!

A Biblical Context for Australopithecines

Joel D. Klenck

Genesis provides a context for australopithecines as a potential helper or *ezer* for Adam before the creation of Eve (Genesis 2:18). This framework explains aspects of australopithecine morphology, range of locomotion, and cognitive abilities, which are different compared to humans or apes. biblical timelines for these suggested helpers broadly correlate with radiometric chronologies where australopithecine skeletal material is prevalent in early paleoanthropological contexts, overlaps with human assemblages, and then decreases as human remains proliferate in later deposits.

The Anatomy of Light Production in *Photinus pyralis*

Mark H. Armitage

Based on research conducted at the Creation Research Society research station near Prescott, AZ, the anatomy of light production in the biological tissues of fireflies will be discussed. Novel structures and functions (not discussed in the voluminous scientific literature) will be presented. These may represent new discoveries by creationists. Unpublished data will also be presented showing additional sophisticated structures associated with the firefly lantern cells.

Computer Simulations of a Geomagnetic Field Model

Timothy R. Clayton

The classical free-decay model of the earth's geomagnetic field provided a straightforward mathematical solution but did not account for evidence of pole reversals. A physical mechanism proposed by a creationist places the reversals during the Genesis Flood due to parcels of fluid in the earth's core moving perpendicular to the geomagnetic field. The movement of fluid parcels produces an electromotive force and an increase in magnetic flux that leads ultimately to a new field of opposite polarity.

This talk uses the physical mechanism to model a system of ordinary differential equations representing the westward and eastward motion of the currents in earth's interior that generate the geomagnetic field throughout history. The mechanism is initiated by a sharp increase in the core temperature at the time of the Flood with the temperature decreasing in succeeding years. The behavior of the field is influenced by the size and velocity of the fluid parcels. Numerical approximations of the system will be made using different parameter values for the parcel size and speed.

Astrochronology II: An Apparent Age of the Time-Dilated Universe from Angular Momentum Loss in Solar-Type Close Binaries—Part 1

Ronald G. Samec and Evan R. Figg

In creation time-dilation cosmologies (i.e., those proposed by Humphreys and Hartnett), one major question is "What apparent age should be used to characterize the universe?" The 14.7-billion-year answer provided by the big bang community should not be accepted due to its false assumptions that are at odds with biblical history.

There are many age-bearing processes in today's astronomy. These "Astrochronometers" include spiral galaxy wind-up time, rotation spin down and magnetic activity of solar type stars and binary star coalescence (magnetic breaking), star cluster ages (isochron age) and nuclear burning ages (stellar aging on the H-R diagram), binary star circularization, stellar kinematic ages, white dwarf cooling age, pulsar spin down age (due to gravitational radiation), radio isochron ages from stellar spectra, and others.

In this paper we will explore the area of gyrochronology: the precise derivation of stellar ages from the orbital period of single solar type stars and interacting binaries. Magnetic breaking due to outflowing winds along stiff fields (called Angular Momentum Loss or AML) steadily steals away angular momentum as stars and binaries age; likewise, the magnetic activity decays with time. In single stars, AML causes their period to increase with time. For binaries, it causes the two stars to steadily coalesce. We now include original observational research from our work at Lowell Observatory. From this work, we find that AC Piscium is a nonsynchronous, fast-rotating near double contact eclipsing binary. Its smaller star is found to be rotating rapidly with speeds of 1.7 times its orbital speed! Notably, the primary is still slightly spun up at 1.15 X the synchronous rate, which means that it was spinning at a faster rate at its creation, like many other single stars. This is unusual. The usual near contact binary is synchronously rotating due to gravitational drag. Indeed, studies from optical interferometry reveal that stars of solar type are rotating at near breakup velocities! These include several stars of "back yard" fame, including, Altair, α Cep (Alderamin), α Oph, and β Cas.

It is our observation that the Creator induced fast rotations in most new stars by whatever means, and solar type stars steadily spin down by magnetic torques induced by AML, while OB and early A, stars unhindered by rotational torques, continue to spin fast throughout their lifetimes. This information may lead to the determination of the apparent maximum age of the universe in time-dilation cosmologies. Of course, the true age of the universe (in earth years) which is ~7000 years, is not in question here.

Soft Tissues in Solid Rocks

Brian Thomas

The discovery and verification of original soft tissue fossils has caused the most significant paleontological disturbance in recent times. Virtually nobody expected this to be possible. Published discoveries of original soft tissue biochemicals, including collagen, elastin, osteocalcin, hemoglobin decay products, melanin, chitin and chitin-associated protein, and others, including live bacteria, from fossil pockets around the world are reviewed. Decay rates and longevity estimates of some biochemicals are estimated and then extrapolated to provide an outside age limit for original soft tissue fossils, and by extension for their associated geologic strata. The organic tissue data imply an age on the order of thousands, not millions, of years for Mesozoic and even some Paleozoic fossils and strata.

Survey and Analysis of Biblical and Creation Worldviews of Arizona Churches

Larry S. Kisner

Your worldview is a collection of basic beliefs, presuppositions, convictions, and values from which you form an understanding and interpretation of this world and your life. What you believe about the Bible, Jesus as God, salvation, heaven and hell, and creation is of vital importance, and the consequences of compromising these views are explored.

The creation worldview, an integral part of the biblical worldview espoused by churches, is examined in more detail. The author is on the board of directors of Arizona Origin Science Association (AzOSA), a nonprofit organization that has been conducting an ongoing survey of the creation views espoused by Arizona churches since 2007. As of January 2009, over 2000 churches had been contacted, and over 400 had responded. Of the churches responding, 104 could be considered solid young-earth-creation (YEC) churches. The questionnaire is in the form of six statements relating to belief in the literal Genesis account of creation and three statements about sin and salvation. The responses of church pastors and church leaders will be analyzed and presented to provide insights into why churches accept or reject the creation worldview, and in particular a literal YEC position. Recommendations for future research will also be presented.

Circular Reasoning in Astronomy

Danny R. Faulkner

The scientific method requires that our models make predictions that we can test against data or observations from the real world. If our predictions match reality, then we say that our model is confirmed. However, increasingly in astronomy we find that data are used as inputs to guide the construction of models and then the same data are used as evidence in support of the models. That is, the same data that guided the construction of the models are used as confirming predictions of the models. I will illustrate this circular reasoning with some examples from astronomy.

Coral Reefs in the Biblical Chronology

Robert W. Carter

The size and structure of coral reefs has been a strong argument for evolutionists ever since Darwin's famous treatise on the subject. Coral reefs are limited to shallow depths. The presence of extinct coral reefs at depth (in the ocean and in the rock record) is a puzzle for young-earth creationism, yet this is not nearly the challenge evolutionists make it out to be. A few of these can be attributed to drowned reef platforms, but most examples cited are not equivalent to the modern reef and are very often misidentified carbonate blocks. Also, essentially all modern reef tracts were exposed land during the height of glaciation. Evolutionists put this at approximately 10,000 years ago. Most creationists put the Ice Age after the Flood and approximately 4,000 years ago. The difference between these two numbers is negligible, since we are dealing with so many estimations and unknowns inherent in all estimations of reef growth rates, and means that even the largest reefs in the world, including the famous Great Barrier Reef of Australia, are recent phenomena. Couple this with the fact that no modern coral reef exists deep in the evolutionary rock record ("ancient" reefs were made of clams, algae, etc.), and most "millions of years" arguments for coral reefs evaporate. We will analyze several important reef claims, including the buried "reefs" associated with oil in Alberta, the Capitan "reef" of Texas and New Mexico, and the incredible depth claims of Eniwetok Atoll.

An Archaeological Context for the Noachian Deluge

Joel D. Klenck

Hebraic verbiage from Genesis is compared to an array of observed data, which suggests an archaeological context for the Noachian Deluge during the transition between Epi-Paleolithic and Pre-Pottery Neolithic A (PPNA) archaeological cultures and the geological epochs of the Pleistocene and Holocene in the Near East. Early PPNA sites near Mount Ararat have cultural similarities with the latter stages of the Epi-Paleolithic, from distant sites such as in Israel and the Pontus Region. The first PPNA sites appear suddenly, in the southern foothills near Mount Ararat, fully formed with elevated organization, craft specialization, central cult structures, monumental architecture, and subsistence strategies based on the procurement of mostly wild plants and animals. That diverse cultures developed in Anatolia from the PPNA milieu and then abandoned sites as populations increased in Mesopotamia also correlates with accounts in Genesis. Multiple lines of data are presented evidencing the pre-Flood period comprised the cultures of the Paleolithic, Mesolithic, and Epi-Paleolithic while subsequent Neolithic, Chalcolithic, and Bronze Age contexts correspond to post-Flood cultures and histories.

Seeing Distant Starlight in Near-Real Time

Mark Amunrud

This presentation traces the concept of space from ancient times to the present. Two key experiments about space are explained with animations. Special relativity was the only hypothesis that explained both experiments.

A new model, quantum space, is based on biblical descriptions of space. Quantum space explains the two key experiments that previously only relativity could explain. Relativity and quantum space make nearly identical predictions in many cases but for slightly different reasons. In situations where they do not agree, quantum space appears to make better predictions.

Quantum space predicts that distant stars would be seen in near-real time. The first night of Adam's life, he would have seen a sky full of stars (two days after stars were formed). Some far-distant stars and galaxies would not have appeared until later in his life.

Quantum space attempts to explain the interaction between space, gravity, and light and, if right, opens doors for advancements in technology that are far beyond today's achievements.

This high-school-level presentation can be understood by people who enjoy science.

Biological Glass Lens Factories: The Nanostructure of Diatoms

Mark H. Armitage

Newly completed research conducted in the electron microscope lab at the CRS VACRC will be presented, elucidating the staggering complexity of diatom glass shells imaged at 40,000X. Sheets of submicron pores and conduits that transverse solid glass diatom frustules will be examined and compared to the most sophisticated human manufacturing activities on earth. Nanometer-sized objects made by diatoms far exceed man's engineering and manufacturing capabilities. Additionally, complex structures built into these glass shells and allow some diatoms to hovercraft at dramatic speeds across sandy and other aquatic substrates will be examined.

Could Magnetic Monopoles Cause Accelerated Decay?

Bruce Oliver and Eugene Chaffin

We study the effect of superheavy magnetic monopoles on nuclei such as Aluminum-26 and Potassium-40 to see if the rate of beta decay is enhanced by the nearby passage of a magnetic monopole. Following an idea of Carrigan from the 1980s, we consider the possibility that monopoles are trapped in the earth's interior by a balance between gravitational and magnetic forces from the earth's fields. Magnetic reversals such as those considered by Humphreys sent the monopoles to the surface during the Genesis Flood, causing nuclear decay rates to seem to accelerate. We use theory developed by Lipkin in the 1980s to treat the theory of perturbation of the decay rates by the monopoles. We show that the monopole velocities attained during a field reversal are sufficient for them to escape during the Flood but not large enough to produce tracks in rocks and minerals similar to fission tracks.

Post-Flood City of Ebla: A Fresh Look

Richard Overman

Rediscovered in 1964, the metropolis of Ebla was a large city of hundreds of thousands of people. The city is located in the current country of Syria on the western side of the Fertile Crescent. Dated by secular archeologists at 2500 B.C., the city of Ebla is believed to be one of the first cities built after Noah and his family got off the ark. Significantly, tens of thousands of cuneiform tablets that have provided a wealth of information about post-Flood civilization have been found.

Early publication of the contents of the Ebla Tablets provided interesting and positive comparisons to the Hebrew Scriptures. To date, creationary writings have focused on these biblical insights and confirmations. More recent comments by the archeologists on the scene have cast doubts on the biblical confirmations. This paper reviews both secular and creationary literature on the city of Ebla. In addition to the biblical ramifications, the paper looks at many aspects of the Ebla culture. Contrary to evolutionary conceptions, the people are quite like us today. Ideas for future research and post-Flood biblical interpretation are presented. The data lead to questions about how creation scientists use secular evolutionary concepts.

Electron Microscopy of Some Unusual Tiny Plants

Mark H. Armitage

Evolutionists consider plants such as the mosses and symbiotic conglomerates such as lichens to be primitive progenitors to "more complex" plants like the vascular plants. But just how primitive are mosses and lichens? In this talk, lichens and mosses will be examined under the light and the electron microscope, and some remarkable features of individual cells will be showcased. Structures unique to lichens and mosses that are not seen in "higher" plants will be discussed.

Nuclear Half-Lives and Changes in the Strength of the Nuclear Force

Eugene Chaffin

Nuclei that are of importance in radioisotope dating have very long half-lives, and calculations show that they are vulnerable to changes in the strength of the nuclear force. Their half-lives can change drastically. Although the "weak force" is the one responsible for beta decays, the decay process is nonetheless very sensitive to the strength of the strong force gluing the nucleus together. I will discuss various possible sensitivities of the half-life for nuclear decays. Nuclear phase changes, such as the onset or loss of pairing interactions or the shape transitions such as triaxial to oblate spheroidal and prolate spheroidal, are interesting effects that could be caused by a change in the nuclear force strength. The pairing interactions, protons to protons or neutrons to neutrons, have been found to disappear at high spin or at nuclear "temperatures" of a few tenths of an MeV. We investigate whether the change in nuclear force strength could cause breaking of the pairing bonds, hence leading to the possible loss of superfluidity or to mixed-phase nuclei. Quantum mechanical calculations are presented, linking changes in various factors in alpha- and beta- decays to variation of the half-life. Calculations are given showing the sensitivity of decay processes to quantities that would be influenced by strong force variation. I discuss the linkage between various quantities and mechanisms by which small changes could possibly lead to large changes in the half-life. That would support the main hypothesis of the Radioisotopes and the Age of the Earth (RATE) project, namely, large acceleration of nuclear decay rates and vastly shortened radioisotope ages for geologic strata. It might also relate to the recent discovery that some nuclei apparently change half-life with the time of the year.

Local Engineering Applications from Large-Scale Cosmology Parameters

Chuck Glatt

The cosmic microwave background (CMB) is touted as the primary evidence for the big bang, but there is nothing from astronomy to indicate that the CMB is more than a local microwave background (LMB). Some scientists hold to non-allowed adiabatic energy absorption when the fabric of space is stretched. I propose that the universe's expansion, first by doubling and later by exponential growth, provides evidence of a young universe and suggest that expanding the fabric of space reduces the energy available to life.

The Reality of Chirality

Charles McCombs

Chirality and the formation of optical activity in organic molecules has long been a major stumbling block for scientists seeking a naturalistic origin of life. Natural processes are known to form a racemic mixture, which is exactly what Stanley Miller produced in his classic experiments, but our bodies' amino acids, proteins, and DNA/RNA contain only chiral molecules, not racemic mixtures. Whenever natural origins of life's molecules are explained by sequential addition of smaller units (i.e., proteins, DNA/RNA, and polysaccharides), the formation of chirality will always be unexplainable. In Miller's experiments, we learn of the problems of chirality in amino acid formation, but the formation of chirality in proteins and DNA/RNA is exponentially a more complicated problem. What we learn from the formation of chirality in proteins does not explain DNA/RNA chirality. What we learn from the formation of chirality in proteins and DNA/RNA chirality does not explain chirality in polysaccharide formation. Chirality is perhaps the best evidence we have against the formation of life from chemicals. Chirality is God's fingerprint on His amazing and perfect creation. The Bible says that God's ways are higher than man's ways and man cannot know them, which is why the formation of chirality is unexplainable by natural processes!

The Inalienable Rights Argument for the Existence of a Creator

Douglas A. Harold and Lindsay N. Harold

Various biblical apologetics arguments have been proposed that together make a logical case for the validity of certain biblical tenets. For instance, the cosmological argument (along with supporting scientific evidence) supports the proposition that there must be a cause for the universe that is external to the universe itself and is therefore supernatural. Considering the cosmological argument alone, this cause may or may not be a personal being. However, the teleological argument (along with the observation of purposeful design in the universe) supports the existence of an intelligent, purposeful, and therefore personal, Creator.

In addition to these and other well-known arguments, we propose a new biblical apologetics argument for the existence of a personal, purposeful, and supernatural Creator. We will review the historical context and meaning of "inalienable rights" and show that the logical support for a just civil government rests on the existence of these rights. We will then build a logical case for a Creator based upon the self-evident premise that humans possess inalienable rights. In so doing, we will endeavor to show that this premise is in fact self-evident and that these inalienable rights can exist only if humans are the work of a supernatural Creator.

Minutes of the 2011 Creation Research Society Board of Directors Meeting

The forty-eighth annual Creation Research Society (CRS) Board of Directors meeting was held 16–18 June 2011, at the Wingate Hotel in Jacksonville, Florida. Present were Mark Armitage, Ted Aufdemberge, Gene Chaffin, Don DeYoung, Danny Faulkner, Robert Hill, Jean Lightner, Gary Locklair, Michael Oard, John Reed, Ron Samec, and Glen Wolfrom (John and Glen participated via Skype). Although Ted's term of service ended just prior to the meeting, he was present at the board's request. Unable to attend were Russ Humphreys and David Rodabaugh.

President Don DeYoung called the first session of the general board meeting to order at 19:05 on Thursday, 16 June 2011. He noted the long and rich history of the CRS. President DeYoung outlined the logistics for the weekend: general board meeting on Thursday, committee meetings on Friday, followed by a tour of Trinity Baptist College, along with fellowship with local CRS members, and the second session of the general board meeting on Saturday. Don noted with sadness the passing of emeritus board member Emmett Williams, who served the society for 35 years. A note from emeritus board member Paul Zimmerman was read, thanking us for remembering him at the passing of his wife. Don shared a letter from emeritus board member David Kaufmann, who was unable to join us due to health issues. Don reviewed our responsibilities as board members of CRS and noted that our work continues between board meetings.

The minutes of the 2010 board meeting, as recorded by recording secretary Gary Locklair and published in the Winter 2010 issue of the CRSQ, were approved. Gary reported the results of the 2011 board elections. Two hundred and twelve ballots were received, and the following were elected to a three-year term: Danny Faulkner, Robert Hill, and Michael Oard. A list of future candidates suggested by the membership was presented.

Financial secretary Mark Armitage noted that we will likely end our fiscal year in the black, while withdrawing only $40,000 from our endowment fund to supplement income. He encouraged board members to be frugal in budgeting and spending.

The board discussed ways to encourage the growth of the society. As the VACRC is a unique creationist resource, a number of suggestions related to its use were proposed. President DeYoung noted that 50% of the board members participated in his "challenge" and resulted in $10,000 donated to the society last year.

Danny Faulkner reported that the CRS has held two successful conferences in South Carolina over the past two years. The CRS conference is unique; there is no creation meeting quite like it. The board thanked Danny for his hard work in putting these together and making the CRS conferences possible.

Don DeYoung reported on a beneficial meeting he and Kevin Anderson attended with Mark Looy at Answers In Genesis during August 2010.

The dates for the next board meeting have been tentatively set for 7–9 June, 2012, in Denver, Colorado. The year 2013 will mark the fiftieth year of the society, and some suggestions for a celebration in conjunction with the annual board meeting were discussed.

The first session of the full board meeting adjourned at 20:55.

Friday, 17 June, was devoted to committee meetings. The Internet, membership, periodicals, and publications committees met in the morning. The constitution, finance, lab, and research committees met in the afternoon. In the late afternoon, the board toured Trinity Baptist College, the site of the upcoming CRS conference. The evening meal was enjoyed in fellowship with local CRS members at the house of the Overmans.

The second part of the general board meeting convened at 08:15 on 18 June 2011. Jean Lightner's devotion focused on wonder and how science provides a sense of wonder as demonstrated by Psalms 19 and 139. The full board spent some time discussing our relationship with other like-minded organizations.

Constitution committee chairman Gary Locklair clarified the length of terms for board members. A member's three-year term starts with the first board meeting after his or her election and ends just prior to his or her fourth board meeting. Outgoing board members may be invited to the fourth board meeting by the president or executive committee for the purpose of mentoring a new board member; however, the outgoing board member does not have voting privileges.

Internet committee chairman Gary Locklair reported on matters relating to the CRS website, CRSnet, and the CRS Facebook presence. The Facebook presence for CRS is new and is slowly gaining friends. A steady growth in website hits and the use of CRSnet was noted. The board thanked its webmaster, Fred Williams, and his assistant, Tony Massey, for their valuable service to the Society. The board commended Glen Wolfrom for his efforts in moderating CRSnet.

Don DeYoung, chairman of the lab committee, indicated that the VACRC lab campus was in good condition. Our greenhouse has been revitalized and is looking good, thanks to an arrangement with a local farmer. The proposed water pipeline across the property is still on hold. Mark has been doing good work with our scanning electron microscope. The iDino project, being conducted jointly with the research committee, received a $10,000 grant from a CRS donor. Kevin continues part time as lab director, CRSQ editor, and researcher. Diane is full time as the society's onsite administrator. The lab budget will be decreased this year.

Jean Lightner presented the membership committee report for Glen Wolfrom, membership committee chairman. The society retained 59% of new members from the prior year (as opposed to 45% in the past). This is a positive trend. The board discussed ways to increase, and encourage, student memberships in the CRS. It was moved and approved to offer a discounted student rate of $15 for the paperless option. This special will run through the end of the year. Glen will prepare a flyer that can be distributed in classes. Because of postage increases, the board moved and approved a price increase for all paper membership and subscriber options of $3 US and $5 foreign. This is the first increase since 2007. New rates will take effect on March 1, 2012.

Periodicals committee chairman Gene Chaffin shared that the CRSQ is currently behind in production and mailing. Jean will serve as a second biology editor (the ninth staff editor for the CRSQ), and Gene is searching for a paleontology editor. The board commended Kevin for the layout and look of the CRSQ. Kevin will finish his term as editor in 2013. Kevin stated he is not a "gatekeeper" for specific ideas or models within creation, but all articles must meet scientific standards of rigor. Our editorial rejection rate is approximately 50% (rising to 60% if those articles not revised by their author are included). Gene noted that Glen continues his outstanding work with *Creation Matters*.

During a break in the board meeting, Ted led the group in song, and Don shared some examples of design in nature.

Mike Oard, publication committee chairman, reported that book sales were down to ~ $30,000. At the same time, book sales are in the black. It has been difficult finding a publisher for our technical material. The board discussed the option of eBooks for some of our material and various ideas for promoting our books. As we are spending extra postage on the CD version of the CRSQ, it was moved and approved that the CRS bookstore warehouse (Diane) will send out CDs (which are now processed by Glen) both individually and with other book sales.

Gene Chaffin, research committee chairman, stated that Diane has produced a new research proposal packet. Mark has been busy with microscopy, and spare parts for our SEM have been budgeted. Gene indicated that two new research projects were approved: "wind river terrace" (Mike Oard) and "astrochronology via binary stars" (Ron Samec). Gene reminded the board that the CRS has research grants available. If the CRS funds research, a publishable paper is expected of the researcher.

Treasurer Danny Faulkner presented information about fiscal year 2010–2011. Danny presented year-to-date figures that indicated a healthy relationship between income and expenses. It appears we will spend less in all financial categories this year. Our fiscal year income includes a $40,000 draw from the endowment funds. Danny was hopeful that the society may be able to fund expenses next year without having to draw from endowment funds. He summarized our financial picture as better than it has been, even if it isn't good yet. Danny and Diane provided estimates of $268,000 of income with $237,000 of expenses for the fiscal year.

Financial secretary Mark Armitage reported on the society's financial holdings. Mark stated that it is customary to "spread out" gains or losses among all the endowment funds proportionally. There was consensus among the board that any surplus income should be used to repay our endowments and not be used to fund additional spending. Mark reported the current value of CRS investments (endowments). An automatic payment plan for our subcontractor, Becky, was proposed. A job description for her position needs to be created and approved.

Treasurer Faulkner and Financial Secretary Armitage led the discussion regarding the 2011–2012 budget. The following committee budget requests were approved: Research—$25,000; Periodicals—$50,000; Publications—$35,000; Membership—$12,500; Constitution—$500; VACRC—$148,500; Finance—$0; Internet—$900; Executive/Treasurer—$15,000.

An operating expense budget of $287,400 for fiscal year 2011–2012 was approved. Danny noted that this will require us to increase our income. It was moved and approved to authorize Diane to make a draw from the endowment funds of up to $20,000 in order to cover expenses. Any additional amount over $20,000 must be approved by the executive committee.

The board submitted the names of Mark Armitage, Gene Chaffin, Jean Lightner, John Reed, and Glen Wolfrom as candidates for the 2012 board of directors election. There are five openings to be filled.

Election of board officers was held. Don DeYoung was elected president, Gene Chaffin was elected vice-president, and Gary Locklair was elected recording secretary. The following were confirmed for the third year of their three-year term: Glen Wolfrom as membership secretary, Mark Armitage as financial secretary, and Danny Faulkner as treasurer.

Three board members were recognized for years of service: Mark Armitage, 5 years; Ron Samec, 10 years, and Don DeYoung, 25 years.

The meeting was adjourned at 12:00.

Respectfully submitted,
Gary Locklair
CRS Recording Secretary

Letters to the Editor

The policy of the editorial staff of CRSQ *is to allow letters to the editor to express a variety of views. As such, the content of all letters is solely the opinion of the author, and does not necessarily reflect the opinion of the* CRSQ *editorial staff or the Creation Research Society.*

Bioelectric Fields and Symmetric Variation

Raoul Kopelman, using a tiny voltmeter of his own invention, detected within the cell electric fields as strong as 15 million volts per meter throughout the cell (Rice, 2008). Enzymes that help repair DNA use an electric pulse to detect the mistakes (Ananthaswamy, 2003). These fields carry important spatial information.

In the flatworm Dugesia japonica, when the head or tail is cut off or damage occurs, either end can be regenerated. Electric fields seem to guide the repairs to whichever end is involved. Playing its part in all this is the enzyme ATPase (Martindale, 2004).

It is symmetric variation via proteins and their protein products that help maintain life forms within their respective kinds; these fields are another aspect of this principle. For more information on how symmetric variation works, see Brown (1999, 2000, 2004).

These fields can be used to heal the body too (Copley and LePage, 2002). Work on bioelectric fields is still in its early days, but I am sure there will be many more wonderful results to come in due course.

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Notes from the Panorama of Science

We Fix Our Eyes Not on What is Seen but on What Is Unseen: Diatom Nanoarchitecture

Introduction

Persons living in an advanced society today would agree that we live in a highly technological world, and that our technology is advancing at an ever-increasing rate. Today it is commonplace to communicate instantly with another individual halfway around the globe. We can receive and send electronic documents with a few keystrokes, and receive products made thousands of miles away in an overnight box. This important technology has its foundation in a recent invention—the chip-based computer.

Personal computers came on the human scene a mere 36 years ago (Carlson et al., 2011). Many experts, including engineers and managers at Xerox and IBM, felt that there was a very limited market for a desktop computer. Today computers are indispensable, and paved the way for Bill Gates and Steve Jobs to become enormously wealthy.

As semiconductor devices are made smaller and smaller, they can more densely populate circuits on chips and computers can run faster and more efficiently. To that end, the National Institute of Standards and Technology (NIST) is in an ongoing race to develop calibration standards that can be used to standardize the optical inspection machines that monitor chip manufacturing. As these chips become increasingly smaller, the ability to accurately measure these improvements must keep one step ahead of the competition (Dixson et al., 2007). It is not uncommon today for chip makers to design and fabricate features on silicon chips that are now 45nm or smaller in size (Zhao and Cao, 2006). A nanometer is 10^{-9} meter.

Calibration tools made by NIST allow standardized measurements to fall within about 2nm or less (Dixson et al., 2007). Chip makers routinely fabricate silicon lines on integrated circuits at approximately 32nm in width, and are striving for ever smaller sizes (de Boor et al., 2010; Zhao and Cao, 2006).

It is quite possible, however, that insurmountable problems may hinder our ability to make chips with features smaller than 32nm. The wavelengths of light required to create these tiny structures (using photolithography) are below 200 nm in width, well into the UV portion of the spectrum. This requires the use of highly specialized lighting and optics. Furthermore, semiconductor wafers must be immersed into a special fluid during the process to image the tiny lines on the chips (French et al., 2005; de Boor et al., 2010; Zhao and Cao, 2006).

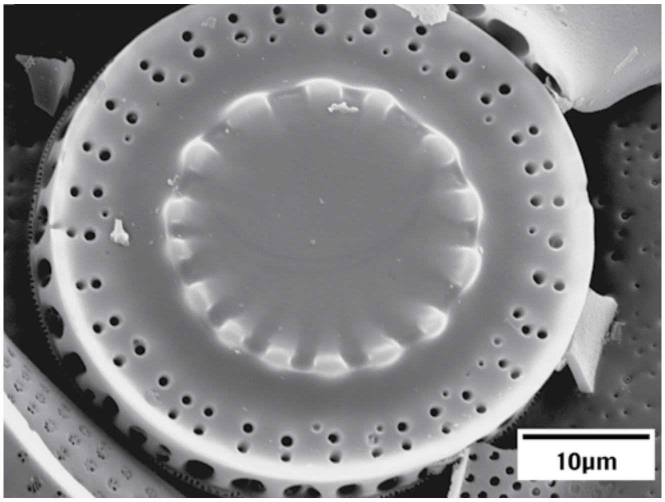


Figure 1. Scanning electron microscope (SEM) photo of a centric diatom. Magnification 2,200X. This is an image of one half of a diatom shell or frustule. Note the tiny pores that adorn the top and sides of the glass frustule.

This can be costly, time consuming, and may introduce new problems into the process. Therefore, our current technology may soon be approaching the smallest structures that man can make using silica. The predominant, and maybe only structure, that engineers are able to make at these infinitesimal sizes are thin, straight lines in silica-based chips. I will now apply this concern to diatoms—living cells that exhibit remarkable capabilities.

Diatoms and Nanometer-Sized Fabrication

Diatoms (Figure 1), discussed at some length by Armitage (Armitage, 2007, 2011; Armitage and Solliday, 2009), are capable of making not only lines, but also banks of pores and banks of slits, posts, tubes, dips, arches, enclosures, and other complex 3D structures in silica, using molecular machinery controlled by DNA with staggering precision and repeatability (Kroger, 2007). Each different species also has the capability to fabricate its own unique, complex geometric frustule (one half of the shell body) "with 3D precision of tens of nanometers" (Losic et al., 2009, p. 2947). This far exceeds the "simple" straight lines seen today in chip manufacturing; thus diatoms can outperform humans in 3D construction. Because something on the order of 200,000 species of diatoms exist (Gordon et al., 2008; Gogoi et al., 2009), much investigation is required to fully understand these remarkable living machines at the nanometer level.

Diatoms are highly prized as tiny factories that fabricate nanometer-sized structures with elegant regularity (Figures 2–17). Furthermore, diatoms have been doing this as far back in time as we can tell (Kroger and Pulson, 2008; Losic et al., 2009) and in enormous numbers since then (Hildebrand et al., 2009). Diatoms may be responsible for some 25% of the total net primary production on earth (Gordon et al., 2008). Scientists are most interested in this "directed nanomaterials synthesis" (Hildebrand et al., 2009, p. 316), especially in our current economic climate when multibillion-dollar investments in nanomaterial fabrication factories are required (Barak, 2009).

The pores that adorn diatom frustules are often smaller than 20nm (Hildebrand et al., 2009; Losic et al., 2007), and in some cases smaller than 10nm (Grachev et al., 2008; Kroger, 2007). These pores are arranged in ultraprecise patterns (often hexagonal) and lattices that can span the entire surface of the frustule (Fuhrmann et al., 2004; Sumper and Brunner 2006; Losic et al., 2007; Gordon et al., 2008; Kroger and Poulson, 2008; Losic et al., 2009). Figures 2–8 show a series of magnified images of the types of pores on diatom frustules (CRS VACRC SEM). Note the regularity of the pore sizes and pore spacing in the resulting lattice.

Diatom frustule pores have been reported to be within a lattice constant of a few nanometers (Vrieling et al., 2000). The author measured lattice constants within about 35nm on pores that are 250nm in diameter (Figures 8 and 17). Pores of 88nm were imaged in some diatoms in this study, but frustule lattices containing sub-80nm pores remained elusive. Ongoing examination will be done at the CRS VACRC to find lattices with such pore dimensions.

Glass, Photonics, and Human Manufacturing

In the area of photonics (the study or application of electromagnetic energy whose basic unit is the photon), the fabrication of minute, glass optical lenses has hit a dimensional wall well before reaching the nanometer-sized structures used in modern semiconductor devices. Ultraprecise machining in lenses (Li, 2009) might one day achieve nanometer resolution, but this has yet to be realized.

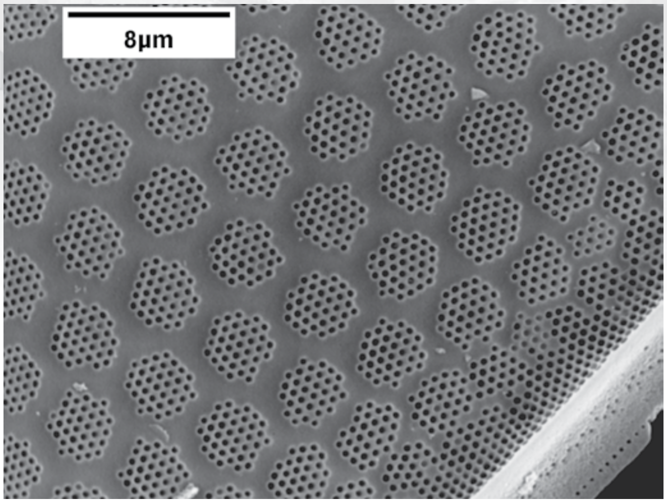


Figure 2. SEM photo of a portion of a centric diatom frustule exhibiting clusters of pores. Magnification 3,500X. Scale bar = 8 microns. A human hair is about 100 microns in diameter.

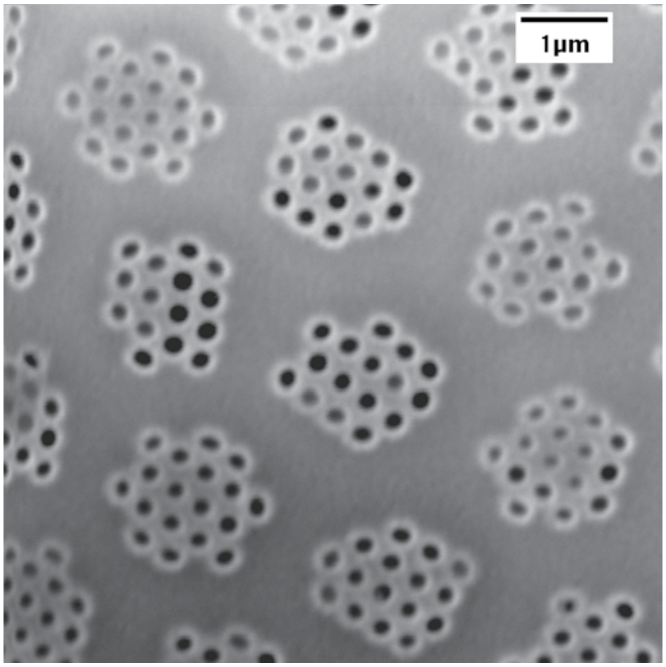


Figure 3. SEM photo of a portion of a centric diatom frustule exhibiting clusters of pores. Magnification 5,000X. Scale bar = 1 micron

Manufacturers so far have been unable to manufacture functional glass lenses smaller than one micron (De Stefano et al., 2007; De Stefano and De Stefano, 2005) and are searching for novel manufacturing technologies to break the 1-micron lens barrier (Sun et al., 2000; Li, 2009). Interestingly, engineers are also realizing that submicron-sized lenses, although seemingly impossible to produce with current technology, already exist in biological structures. Diatoms are now being intensely studied as templates for modern, submicron lens manufacturing and other photonic nanometer-sized structures (Sumper

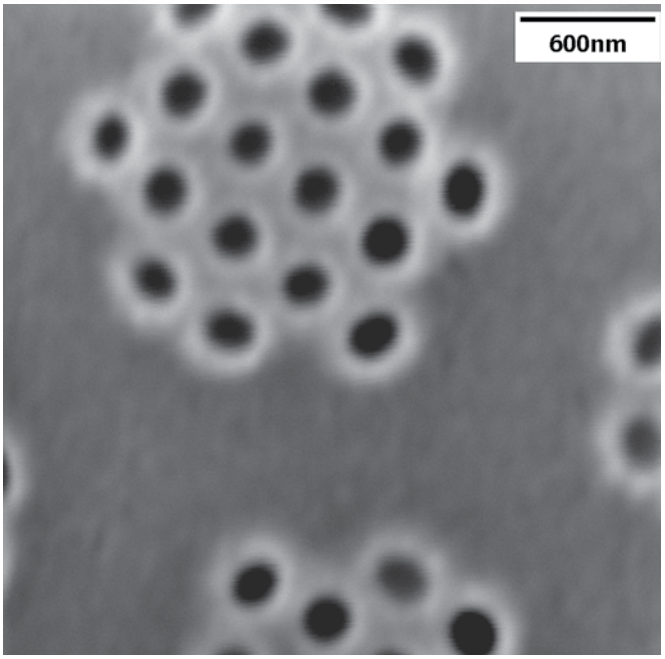


Figure 4. SEM photo of a portion of a centric diatom frustule exhibiting clusters of pores. Magnification 25,000X. Scale bar = 600nm. Pore size = 150nm.

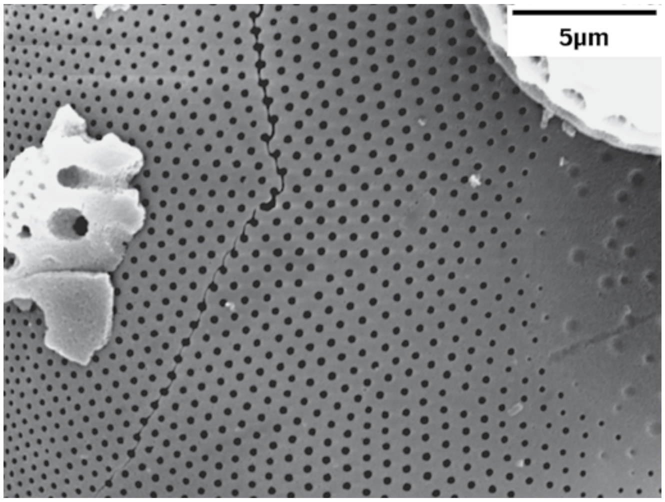


Figure 5. SEM photo of a portion of a centric diatom frustule exhibiting a lattice of pores. Magnification 5,000X. Scale bar = 5 microns.

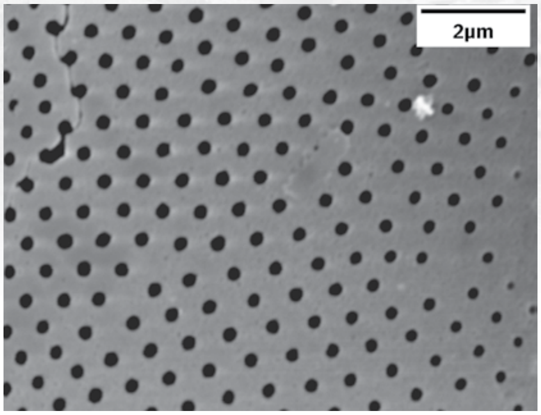


Figure 6. SEM photo of a portion of a centric diatom frustule exhibiting a lattice of pores. Magnification 11,000X. Scale bar = 2 microns.

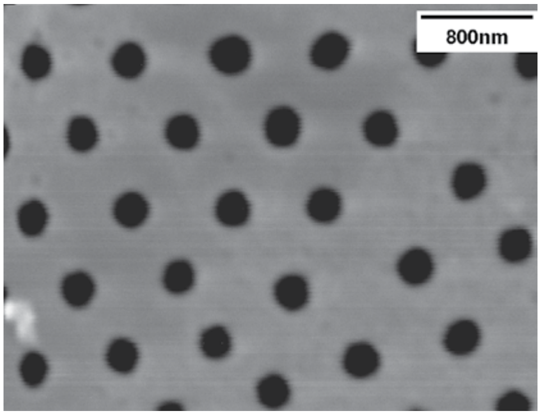


Figure 7. SEM photo of a portion of a centric diatom frustule exhibiting lattice of pores. Magnification 24,000X. Scale bar = 800nm.

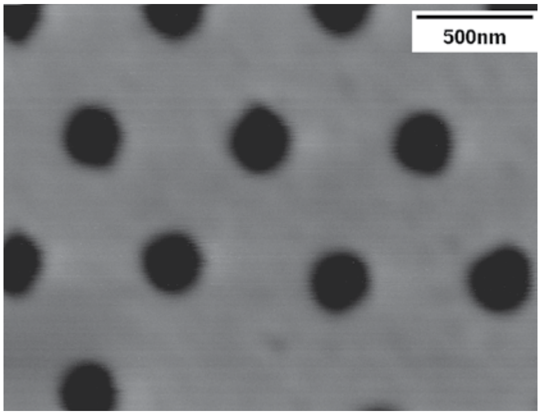
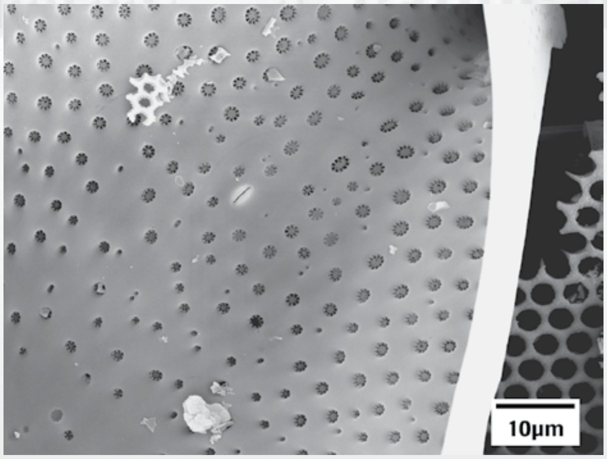
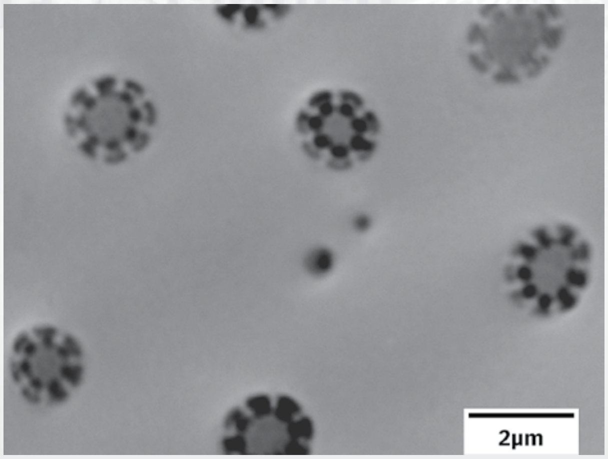
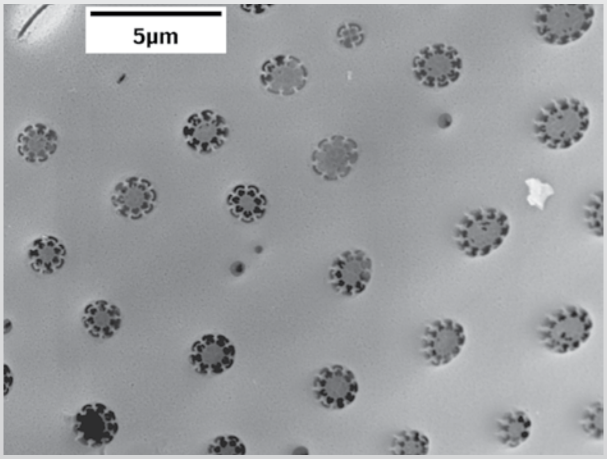
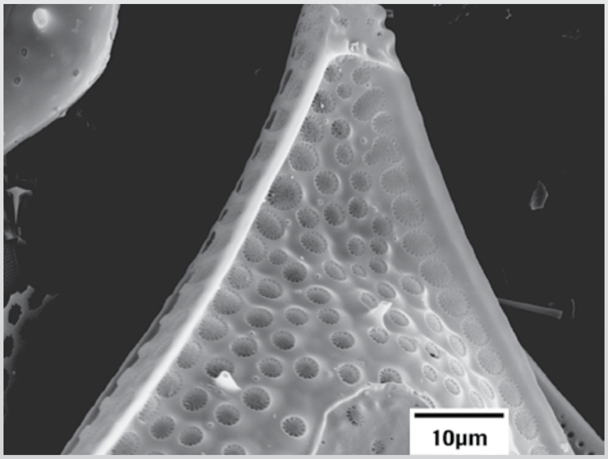


Figure 8. SEM photo of a portion of a centric diatom frustule exhibiting lattice of pores. Magnification 50,000X. Scale bar = 500nm. Pore size = 250nm.

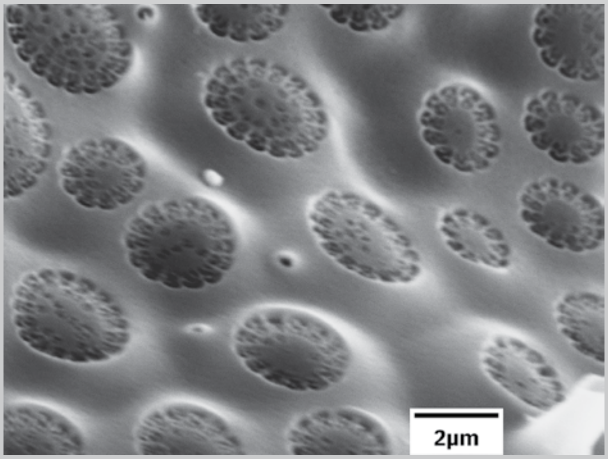








Figures 9–13. Various SEM photos of ornamented pores on triangular diatom frustules. Similar ornamentation on tiny pores is common.



and Brunner, 2006; De Stefano et al., 2007; Helmecke et al., 2008; Kroger and Poulson, 2008; Losic et al., 2009). One group of workers has successfully employed a diatom frustule impregnated with germanium to produce a photoluminescent light signal (Jeffryes et al., 2008), and other efforts along this line are ongoing.

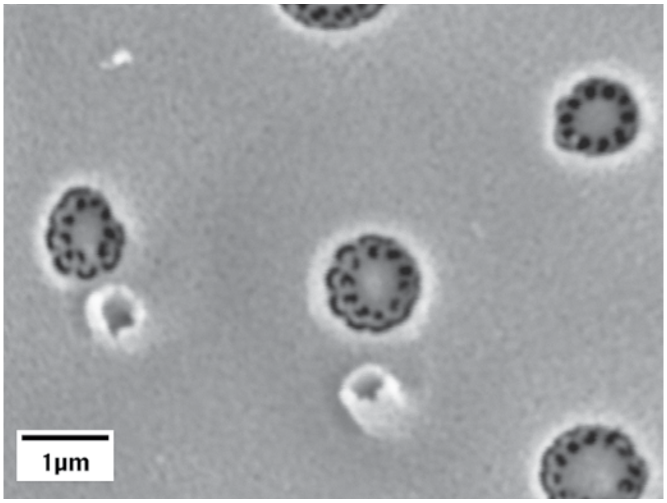


Figure 14. SEM photo of a portion of a triangular diatom frustule exhibiting ornamented pores. Magnification 15,000X. Scale bar = 1 micron.

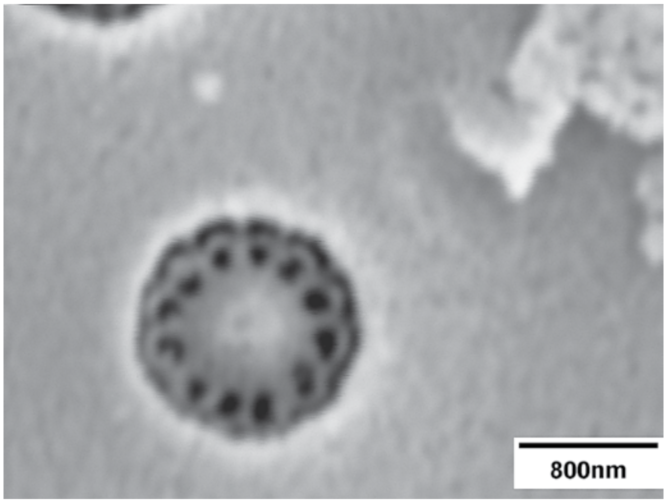


Figure 15. SEM photo of a portion of a triangular diatom frustule exhibiting ornamented pores. Magnification 30,000X. Scale bar = 800nm. Pore size = 88nm.

Claims of Evolution

No evidence for diatom evolution exists, even though they are very common fossils distributed all over the earth. Diatom researchers readily acknowledge the remarkable structures and optical properties of diatom frustules. Workers attempting to devise a computer simulation to explain how diatoms form

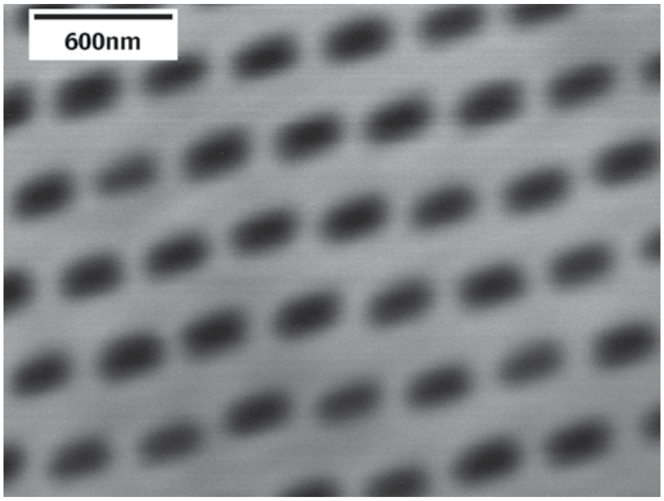


Figure 16. SEM photo of a portion of a centric diatom frustule exhibiting a lattice of oval pores. Magnification 40,000X. Scale bar = 600nm. Pore size = 200nm.

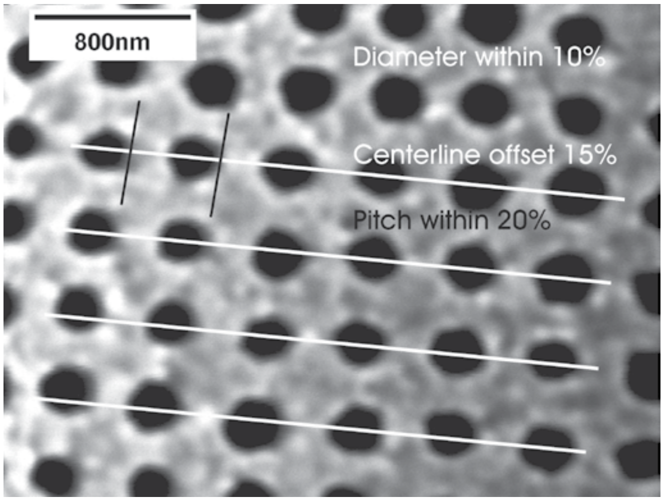


Figure 17. SEM photo of a portion of a centric diatom frustule exhibiting a lattice of circular pores. Magnification 34,000X. Scale bar = 800nm. Pore size = 250nm. Note that the diameters of these tiny pores are within 10% or 25nm of each other and the pitch (measurement from leading edge to leading edge) is within 20% or 63nm

these minute intricate structures acknowledge, "The variety of intricate patterns in valve morphogenesis is breathtaking" (Willis et al., 2010, p. 297). Although biologists and manufacturing engineers are dumbfounded by the complexity they admire, and they must use sophisticated software engineering methods to mimic the production of diatom frustules, they make no attempt to credit an intelligent designer for the process.

Statements such as, "The unique frustule morphologies have arisen through tens of millions of years of evolutionary selection, and so are likely to reflect optimized design and function" (Losic et al., 2009, p. 2947) and "Organisms have developed unique solutions to complex optical problems through sophisticated control of structural features" (Losic et al., 2009, p. 2950), are sprinkled throughout the literature.

One most remarkable feature of diatom, silica-based nanoarchitecture is the method by which silicious houses are assembled by these tiny plants. Diatoms (among other organisms) employ vesicles (small fluid-filled sacs) inside of their single cells to concentrate the silica compounds required for frustule assembly. They then preassemble silicious structures within the vesicle (silica deposition vesicle, or SDV) prior to transporting them outside of the cell. Finally, they are fastened into the frustule in the final assembly process (Schmid and Schulz, 1979; Li et al., 1989; Martin-Jezquel et al., 2000; Grachev et al., 2008). For these reasons, preassembled silica structures exported by the plant cell from an internal SDV to the exterior environment must be precisely oriented and fastened into the exact place they are needed in order to become part of a three-dimensionally symmetrical geometric glass house. The control mechanisms for this nano-sized manufacturing require astonishing complexity.

No evidence exists that optimized design and function (or even the staggering geometry of diatoms—see Armitage, 2011) can arise through random stochastic mechanisms. Those of us who hold to a Creator God as the only reasonable explanation for the existence of the hyper-design found on a miniscule scale throughout all earth systems and organisms, including diatoms, clearly have, by far, the best explanation.

What Diatoms Really Say About Life and Technology

We humans have made remarkable strides in our manufacturing efforts. Nanometer-sized machines are used in medicine and other fields to solve human problems, yet it appears unlikely that humans will ever create any practical functioning machine on the order of angstrom sizes, such as the molecules that are quietly and constantly working in every cell of our bodies (Model et al., 2008). Diatoms are as dust on the wind to many on earth who are unaware of them, yet they are quietly speaking in a gentle whisper to us about the Creator (1 Kings 19:12) that God is indeed with us.

Acknowledgments

I am indebted to Jerry Bergman and Kevin Anderson and the anonymous reviewers, who greatly improved the quality of this paper. I also thank to donors to the CRS Research Fund and the Van Andel Creation Research Center, in particular Ray and Lois Strom and Arlin and Lois Penner. Interest from these endowments has financed this work. Soli Deo Gloria.

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Neandertal Genes Revealed In Us

Recently Yotova et al. (2011) worked to establish a Neandertal-derived X chromosome segment in all contemporary non-African, human populations.

> Recent work on the Neandertal genome has raised the possibility of admixture between Neandertals and the expanding population of Homo sapiens who left Africa between 80 and 50 Kya (thousand years ago) to colonize the rest of the world. Here, we provide evidence of a notable presence (9% overall) of a Neandertal-derived X chromosome segment among all contemporary human populations outside Africa. Our analysis of 6,092 X-chromosomes from all inhabited continents supports earlier contentions that a mosaic of lineages of different time depths and different geographic provenance could have contributed to the genetic constitution of modern humans. It indicates a very early admixture between expanding African migrants and Neandertals prior to or very early on the route of

> the out-of-Africa expansion that led to the successful colonization of the planet (Yotova et al., 2011, p. 1957).

A second article in August 2011 is another description of a large percentage of modern human immunity being derived from ancient Neandertal and archaic human populations.

> Virtual genotyping of Denisovan and Neandertal genomes identified archaic HLA haplotypes carrying functionally distinctive alleles that have introgressed into modern Eurasian and Oceanian populations. These alleles, of which several encode unique or strong ligands for natural killer cell receptors, now represent more than half the HLA alleles of modern Eurasians and also appear to have been later introduced into Africans. Thus, adaptive introgression of archaic alleles has significantly shaped modern human immune systems. (Abi-Rached et al., 2011, p. 89)

Therefore, from these two studies it has been revealed that humans are genetically related to Neandertals. While I do not agree with the dating methods employed by these researchers, their DNA data can readily be separately interpreted. I have previously suggested such a human-Neandertal relationship (actually Neandertal-human ancestry) as described in these studies (Cuozzo, 1998).

This genetic link of human and Neandertals has recently been questioned by Klenck (2010, 2011). For example, he argues:

> To sum, the Nephilim were the products of angelic and human couplings, evil acts that resulted in the damnation of their progenitors. Nephilim populations flourished at least twice before the Flood: as descendants of Adam began to populate the earth and afterwards. Their populations were human, yet different and fallen. Their physical prowess enabled their success as they pursued aggressive acts that furthered their reputation. However, their heroism was not oriented toward altruism but toward their own vanity and search for reputation, as they schemed and successfully practiced continuous acts of evil. Nephilim populations were extirpated in their entirety by the Flood and most likely did not contribute to the genetic heritage of Noah and his descendants. Noah was a direct patrilineal descendant of Adam and untainted by the evil ancestry or acts of the Nephilim (Klenck, 2010, p. 113).

Dr. Klenck (2010, p. 114) further states, "Therefore all human populations with characteristics outside those of anatomically modern humans—including but not limited to some specimens attributed to *H. habilis* and *H. rudolfensis* and most remains attributed to *H. ergaster*, *H. erectus*, *H. antecessor*, *H. heidelbergensis*, *H. neandertalensis*, and *H. floresiensis*—should be interpreted as Nephilim or populations genetically influenced by the Nephilim." Thus, Klenck is concluding that Neandertals (the subject of my research for over 30 years) were Nephilim.

Yet, we know from the Bible that we are all derived from one righteous man Noah and his family. Klenck (2010, p. 113) correctly observes that Noah was "untainted by evil ancestry or acts of the Nephilim." But Klenck also said we did not inherit any Neandertal (Nephilim) genes, which is contrary to my own research, as well as these recent genetic studies. Klenck wrote, "Nephilim [Neandertal and others] populations were extirpated in their entirety by the Flood and most likely did not contribute to the genetic heritage of Noah and his descendants" (Klenck, 2010, p. 113; brackets added). We know his descendants are us, but now we also know that we have some Neandertal genes. Since we all agree that Noah was not a Nephilim in any way, he must have carried Neandertal genes or was a Neandertal himself. Therefore, Neandertal genes were not extirpated by the Flood.

Therefore, the presence of Neandertal X chromosome segments and HLA haplotypes in the contemporary human genomes could only come from Noah's family. All true Nephilim genes were eliminated at the Flood. So, only Noah's 100% human Neandertal family genes went on to future generations devolving and mutating as they wound their way through the canyons of time. "For the creation was subjected to futility, not willingly, but because of Him who subjected it, in hope that the creation itself also will be set free from its slavery to corruption into the freedom of the glory of the children of God" (Rom. 8:20–21 NASB). "Dying thou dost die" (Gen 2:17 YLT).

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For Now We See Only a Reflection: Notes on the Reflector Layer in *Photinus pyralis* Lantern Tissues

I have previously described the use of electron and light microscopy to illustrate the highly engineered fine structures employed to manufacture light in the firefly *Photinus pyralis* (Armitage, 2008, 2009). In those descriptions I noted that the lantern cells of *Photinus* have two basic layers: a photocyte layer that produces the light and another, specialized layer, lying just dorsally to the photocyte layer (Armitage, 2008). This specialized layer seems to function as a reflecting (or reflector) layer, reflecting light produced at the back of the lantern to the environment, much as a flashlight reflector reflects light (Armitage, 2008).

There is, however, little detail in the literature that explains these fascinating structures. Buck (1948), Smith (1963), and Ghiradella et al. (2004) all characterize the layer lying just below the lantern tissues as a "dorsal layer" and refer to it as a "so-called 'reflector layer.'" The reasons for their reluctance to use the descriptive term "reflector layer" is unknown, but Smith (1963, p. 325) notes that "Buck (1948) points out, the evidence that they reflect the light emitted by the photocytes is slender." Both Buck and Smith admit that the "reflector layer" might contain a bed of urate crystals, yet they are reluctant to refer to it as a functioning reflector and persist in calling it a "dorsal layer." Kluss (1958, p. 179) provided electron micrographs of portions of the layer and plainly called it a reflector layer containing urate granules, but he lamented that the granules "were dissolved in preparing tissues for sectioning," and his electron micrographs showed only what he termed empty "urate vacuoles."

In later work, Peterson (1970, p. 104) described the same layer in larvae of fireflies containing "a cup-shaped dorsal 'reflector layer.'" She also characterized the reflector layer as "having 'empty' granules (usually considered to have contained urates)."

Little attention has been paid to the "reflector layer" in subsequent work except for trivial mention, as characterized by Ghiradella's report that the "reflective layer" is of "undetermined function" (Ghiradella, 1983, p. 146).

Tissues prepared for my studies have consistently shown a robust, optically active reflector layer that readily stains in reagents developed for tissue embedding in plastic, therefore a discussion of the reflector layer is warranted.

Materials and Methods

Individual animals were caught live in flight during the summer of 2007 in Lynchburg, Virginia. They were then bisected and immediately immersed in 2.5% glutaraldehyde buffered with 0.2M sodium cacodylate buffer. In the lab, abdomens were dissected and the lanterns removed and placed overnight in freshly prepared glutaraldehyde. This was followed by several washings in sodium cacodylate and by postfixation in 2% aqueous osmium tetroxide for 4 hours (with microwave-assisted energy). Rewashed abdomens were then microwave processed through a graded series of acetones and infiltrated with Embed 812 (Electron Microscopy Sciences, Hatfield, PA), also assisted by microwave processing. Blocks were heat cured overnight, sectioned on an LKB (Bromma, Sweden) Ultramicrotome III.

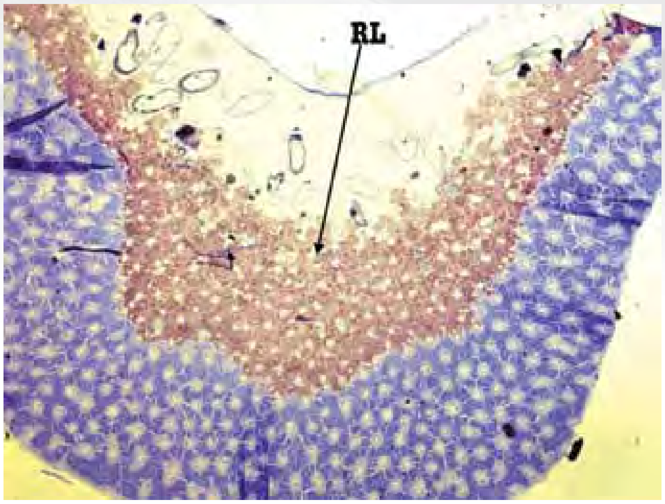
Sections for light microscopy were affixed to glass slides, stained with Epoxy Tissue Stain (EMS), coverslipped, and photographed on a Nikon 80i microscope in both brightfield and polarized light. For confocal microscopy, sections were left unstained, coverslipped, and imaged on a Leica SP5 confocal microscope using excitation lines of 515 and 550 nm. Transmission electron microscopy of sections of the reflector will be described in a future paper.

Results and Discussion

As described previously (Armitage, 2009), the photogenic layer is arranged in what is called a rosette pattern circumscribing the trachea (which delivers atmospheric gases to the photocytes for the light reaction). In similar fashion, the morphology of the reflective layer closely follows the rosette pattern seen in the lantern cell layer lying just above it. The reflector layer is also tightly conjoined to the lantern layer, so it would efficiently capture all light leaving the back of the lantern layer. This was previously unreported.

Materials used in this study dramatically stained with Epoxy Tissue Stain (ETS, a polychromatic stain). Buck (1948, p. 404) reported that the reflective urate layer "fails to stain with ordinary acid dyes … so that in conventional histological preparations the layer is clear." It is assumed that by "conventional histological preparations," Buck means paraffin processing of tissues. Furthermore, Buck (1948, p. 404) maintains that the "crystals … are mainly dissolved out by the dilute alcohols" during processing. As stated previously, Peterson (1970) reports similar results, namely that the granules appear "empty" as if urate crystals have similarly been dissolved away during processing.

In the present study, tissues were processed into a liquid polymer, which was heat-cured and stained with ETS. The reflective layer stained a rusty red in contrast to the blue staining of the photocyte layer (see Figure 1). The current method of processing tissues for electron and light microscopy (employing acetone and/or microwave energy) yield better-preserved structures, such as intact urate crystals that stain well in epoxy tissue stains for light microscopic examination (Figures 1 and 3). The cells making up the reflector layer appear to be well



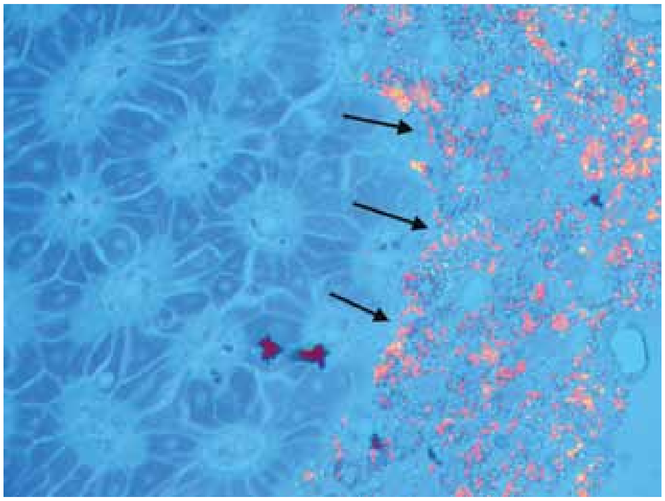
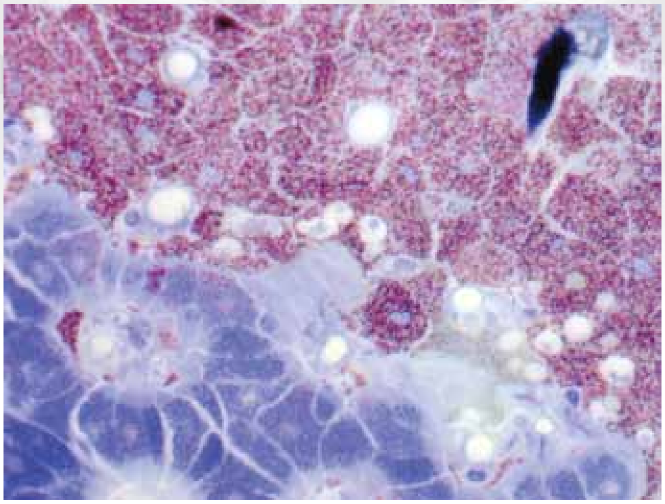


Figure 1 *(top)*. Thin section of *Photinus* lantern and reflector tissues, stained with epoxy tissue stain photographed in brightfield microscopy. The arrow is pointing to the reflective layer, which lays just below the lantern layer. Note that the reflector layer is populated with many darkened granules. Magnification is 250X.

Figure 2 *(bottom)*. Thin section of unstained *Photinus* lantern and reflector tissues in polarized light microscopy. Note that the crystals embedded in the reflector layer are highly birefringent (arrows), an indication of their crystalline nature. The lantern tissues on the left are un-reactive, indicating they lack crystals. Magnification is 630X.



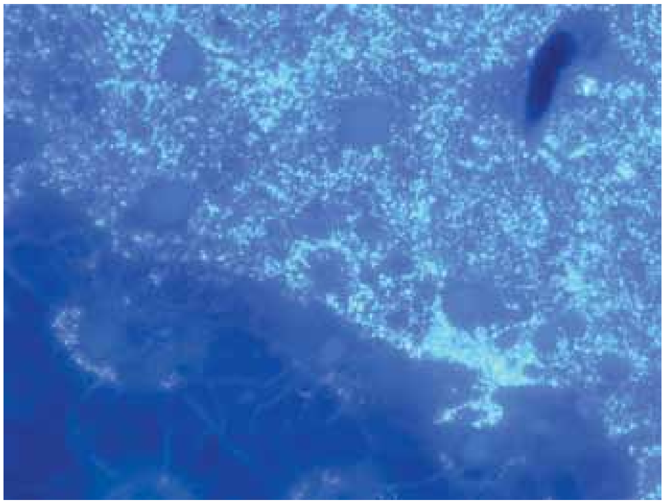


Figure 3 *(top)* and Figure 4 *(bottom)*. Thin section of stained *Photinus* lantern and reflector tissues. This pair of micrographs of the same field of view was photographed in brightfield and then in polarized light. Note that the reflective layer is highly birefringent in polarized light. Magnification is 1000X.

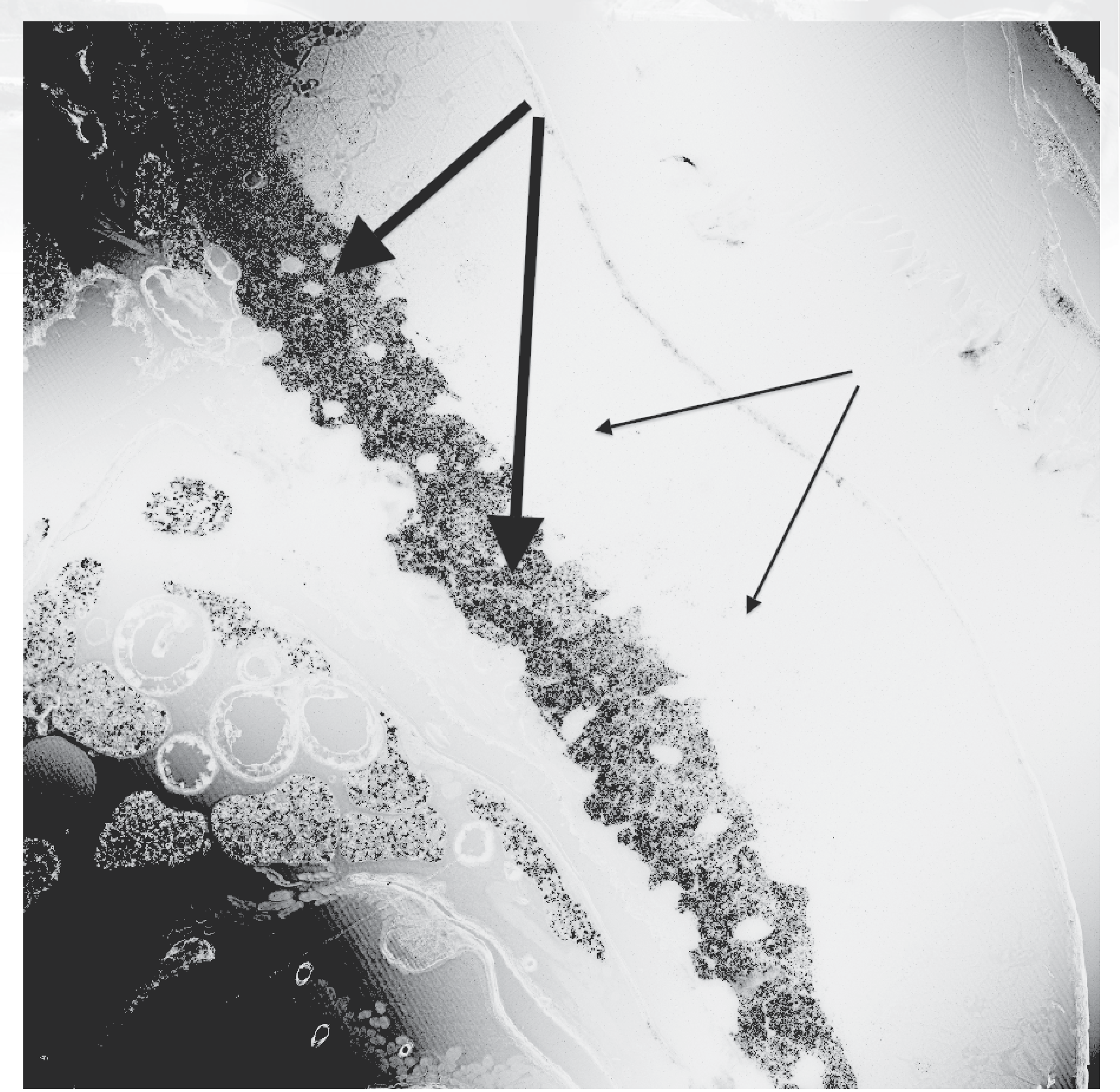


Figure 5. Thin section of unstained *Photinus* lantern and reflector tissues under confocal microscopy. This section was exposed to single laser excitation lines of 515nm and 520nm and the reflector layer (large arrows) shows high reactivity to these light wavelengths, while the lantern tissues (small arrows) do not. Magnification is 200X.

populated with darkly staining granules and not clear granules as reported by Buck (1948) (Figure 3).

The present tissues were dehydrated via a graduated series of acetones (to 100% acetone), unlike the alcohols employed by previous workers, yet the reflective layer is heavily populated with crystals that also demonstrate high birefringence under polarized light (see Figure 2 and 4). None of the photocytes exhibit any birefringence in polarized light, yet almost all the reflective layer tissues do (Figures 2 and 4), glowing markedly and indicating the presence of crystals in the reflector layer.

The current processing method evidently preserves the urate crystals, which are optically active in unstained reflector tissue sections.

Buck (1948, p. 404) brushed aside previous chemical work on the reflector layer, suggesting that the "dorsal (reflector) layer is ammonium urate." Because the work was not corroborated "by modern analytical technique," he concluded, "No agreement exists as to the function or functions of the reflective layer," and he "doubt[s] whether the reflecting efficiency of the layer can be very high." Yet as far as we know, no workers have yet attempted to characterize the nature of the reflector layer.

Various studies report that light emissions from firefly lantern tissues occur over a range of 550nm to 580nm (Seliger and McElroy, 1960; Biggley et al., 1967; Aprille et al. 2004; Oba and Kainuma, 2009). Furthermore, female firefly eye receptors are finely "tuned to maximize the detection of the luminescence signals of mates" in the same region of the spectrum (Oba and Kainuma 2009). It was logical to conclude that the reflective layer was also "tuned to maximize" the same sensitivity to light in the 550nm to 580nm region of the spectrum.

Unstained sections of the reflective layer were excited by autoflourescence under confocal microscopy with single laser excitation lines of 515nm and 520nm. They were then scanned for autofluorescence emission in the 550–580nm region. The reflector layer emitted very bright light and appeared to have the opposite reaction to this excitation light than did the lantern layer (Figure 5). The reflector layer emitted so much light that it appeared almost entirely white compared to the dark and seemingly unreactive lantern layer. The lantern tissue shows little to no response to the laser excitation lines. The lantern tissue was also exposed to a 485nm line of excitation and was similarly unreactive. Images were collected monochromatically in order to clarify the emission light.

The reflector layer thus appears to be highly populated with crystalline granules that are brightly birefringent in polarized light and finely tuned to react to the light produced by the lantern tissues. This clearly fits a creationiary perspective. Fireflies are designed to do what they do with a high degree of efficiency and fidelity because they were designed by a Creator God, and not by unobserved stochastic evolutionary processes. Sadly, our evolutionist colleagues have come to the opposite conclusion. Ghiradella and Schmidt (2004, p. 212) state, "We can think of no more exciting or rewarding quest than to understand how a biological system can evolve such ability to control the release of stored light." How much more exciting and rewarding it is to know The One who is The Light and who also made the fireflies!

Finally a correction must be noted in a previous panorama note. It was incorrectly stated that one of the gases that fireflies synthesize from atmospheric gases to control the flashing of the lantern was nitrous oxide (Armitage 2009, p. 225). The correct gas is *nitric* oxide.

Acknowledgments

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